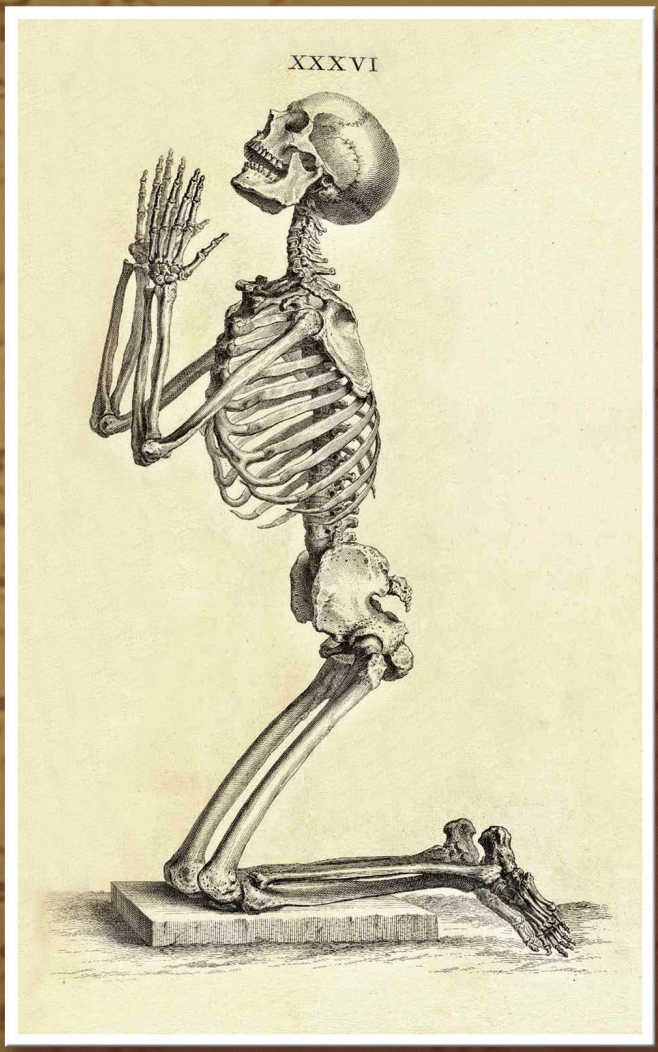
Physical Signs in Medicine and Surgery

An Atlas of Rare, Lost and Forgotten Physical Signs



Dr. Fred Ashley White

PHYSICAL SIGNS
IN
MEDICINE AND SURGERY

PHYSICAL SIGNS IN MEDICINE AND SURGERY

An atlas of rare, lost and forgotten physical signs

includes a collection of extraordinary papers in medicine, surgery and the scientific method

Fred Ashley White

B.S., D.D.S., F.I.A.O.M.S., F.I.C.P.S.
Emeritus Consulting Medical Staff with Surgical Privileges
Columbia / HCA Medical Centers
Marion Community Hospital
Ocala Regional Medical Center
West Marion Community Hospital
Emeritus Fellow, International Association of Oral and Maxillofacial Surgeons
International College of Physicians and Surgeons
American Academy of Oral and Maxillofacial Pathologists

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For Shelly & For Ethan

The two brightest stars in an infinite galaxy, for without their love,
there would be nothing.

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QUOS DEUS VULT PERDERE PRIUS DEMENTAT

Those who god wishes to destroy he first drives mad.

PREFACE

In the early 1980's what began as research on the archaeological evidence of the primary bubonic plagues morphed into the world's most exhaustive collection of rare, lost and forgotten physical signs of disease. This atlas of physical signs in medicine and surgery sheds light on three thousand years of diagnostic secrets. This atlas contains for reference the ultimate collection of extraordinary papers in medicine, surgery and the scientific method, spanning some five hundred years. Together, this group of landmark essays with the searchable index of medical findings is the most complete atlas of physical signs ever established.

What makes physical signs in medicine unique are that they are most often very accurate, dependable, and repeatable without the requirement for specialized medical equipment. Because of these reasons, this atlas was originally conceived for doctors providing needed care in dangerous, rugged, and remote situations often created by catastrophe, disasters, epidemics, and military conflicts. It is within these serious environments that this atlas can assist practitioners find the most obscure and difficult diagnosis where access to x-rays and modern laboratory equipment are impossible. Designed with a revolutionary reference style of key words tagged to known medical systems, the atlas functions as an easy to use clinical field manual whether in use in an advanced medical care unit or in the harsh realm of the jungle.

Physical signs are the objective indications of medical facts and findings that are detected by physicians. By this definition, a sign is different from a symptom, which is the variable subjective experience reported by the patient. A physical sign is often not even noticed and has no meaning for the patient. However, to the physician these occult signs can reveal the hidden and even the most obscure diseases.

Some interesting examples of subtle prepatent findings can be seen as: when pressure is applied to someone's cheek and in response there is the slightest raising of their arm, this could easily be overlooked, but with grave consequences since it reveals an early urgent diagnosis of tuberculoid meningitis. Another of the subtlest findings are: hearing the faintest whiff sound near someone's open mouth or seeing a slight rhythmic pulsation of the arteries within their nostrils. Both of these last two abstruse signs are also life saving discoveries, with each indicating an aneurysm of the thoracic aorta. An additional archetype case where the finding was hidden but the discovery is far from subtle is: during the most routine exam you palpate beside the sternomastoid and scalenus medius and the patient has a violently painful response, this action reveals a *sub rosa* classic sign, indicating splenic rupture and intracapusular haemorrhage.

Physical signs can have a huge range of strange presentations, like the patient that is unable to stick out his tongue when asked to do so. This could have gone undetected until death. How often does one really stick out their tongue? This obscure sign is indicative of the dreaded louse-borne typhus fever. What about the overwhelming, uncontrollable urge to bark like a dog or dance wildly to no music? Both of these abhorrent signs are caused by ergot poisoning. Another interesting case, is the quiet patient with a prolonged evil grin and raised eyebrows. As it turns out, they are not upset about the long wait to be seen, but are infected with deadly tetanus. Next, imagine offering someone a glass of water, they recoil violently and begin having painful laryngeal convulsions, all this just from the mere sight of the water. They plead and beg for you to please take it away and then only get relief when the water is out of sight. This hydrophobia sign is the classic description of someone infected with rabies. The fear of this disease, caused by the *Lyssavirus,* was so great at one time, any person supposed to be suffering from it could be legally smothered. (Curran1879) (*AACM* 1896)

It has also been the occasion, that more than a few of the descriptions of the physical signs contain bizarre and disturbing language and may be considered harsh or offensive toward different groups of people. That is of no ill intent, but for the accuracy of what the physician was explaining these terms must remain. You will find insensitive labels like tramps and vagrants, as well as references to intense descriptions that read like, "A viscid matter of a very offensive smell, like that of spoiled vinegar, or according to Rayer like that of mice or garlic, exuded from the whole surface of each affected hair." One can see here, that it is quite difficult to improve on such an eloquent phrase that mentions the odor of mice. (Rayer) (*AACM* 1896)

Within this comprehensive atlas one will also find detailed references to physical signs associated with different animal species. This is due in fact, to the emergence of zoonotic diseases and the diagnostic challenges presented with these pathogens. A zoonotic disease, also called a zoonosis, is a disease occurring in animals which can be transmitted to humans. In 1963 an exhaustive research list of diseases that human populations shared with animals was as follows: 65 with dogs, 35 with horses, 32 with rats and mice, 26 with poultry, 42 with pigs, 46 with sheep and goats, and 50 with cattle. (Hull 1963) Today's list is considerably broader with zoonotic diseases discovered in deer, armadillos, rabbits, guinea pigs, fish, caribou, bison, elk, turkeys, pigeons, kangaroos, opossums, amphibians, crustaceans, flying squirrels, camels, crabs, shrimp, snails, cockatoos, and beavers, and this is just a very abbreviated list. Wild monkeys and apes alone are the hosts to hundreds of arboviruses, bacteria, fungi, protozoa, and can even be infected with twenty species of malaria. Domestic pets and farm animals on a daily basis expose humans to various flies, ticks, fleas, mites, and worms, all pathogenic vectors of disease, and that is not to mention the misleading dogma: that cat's and dog's mouths are cleaner than humans. How many people do you know routinely kill and eat raw—rats, toads, snakes, bugs, and other wild animals and birds, as well snack on rotting carcasses and faeces? When you put it in a list like that, it sounds eerily familiar like a witches's brew of virulent death. Fortunately for us, our immune systems are somewhat comfortable with the habits of our cherished

domestic animals. However some additional serious concerns are the new exposures to exotic pets as well as trends to eat exotic game animals, all increasing the source of deadly infections. In the United States, Asia, and Africa poachers are of particular interest. They illegally kill or capture many animals and are exposed to disease pathogens by the bites and scratches from the prey, not to mention the deadly diseases from the bites of the lice, fleas, and ticks infesting these animals. Poachers often field dress the kill, also exposing themselves to the infectious blood and body fluids. These individuals and their practices are of a grave concern. It may well be the consumption or trade in illegal animals, along with evolutionary and mutational zoonoses that cause the final fatal pandemic that devastates all humans.

Another area of concern and sensitivity is that of the forensic anthropological signs of homicide. The physical findings on victims that can indicate the differences between an accidental death or murder should be reserved from the public eye. These sacrosanct facts of crime scene investigation will not be included in the atlas and with hopes will remain with the few professionals trusted with such secrets.

Sometimes physical signs appear with brilliant unmistakable colors. The distinct yellow palms of typhoid, the raven black urine associated with blackwater fever, the brilliant red jelly mucous passed with amoebic dysentery, the purple gums of chronic copper poisoning, and of course, the crisp blue line on the gums from chronic lead poisoning. Additionally internal injuries like acute haemorrhagic pancreatitis offer some excellent colorful presentations. There can be bluish patches of grid like cyanotic skin in the loin, which have the appearance of the late extravasation of urine. This is due to the direct action of the pancreatic juice escaping via the retro peritoneal tissues. This pancreatic finding is usually accompanied with a yellow discoloration around the umbilicus which helps to differentiate it from the blue coloration of the umbilicus, as a keen diagnostic sign where a ruptured extrauterine pregnancy exists. Again blue is the finding, but here it presents as the vivid color of the scrotal tissue, which can demonstrate the ominous sign of a ruptured aorta.

Medical diagnostic signs can be found to fall into several categories. Anamnestic physical signs indicate the past existence of a certain pathology, while prognostic signs point toward pathology the patient will face in the future. Pathognomonic signs are the physical signs which illuminate beyond a doubt that a particular disease is present.

Building the atlas of rare, lost and forgotten physical signs has been a dynamic long term project and should be considered as a work in progress. There will always continue to be additions, corrections and updates as more ancient archives are tapped. There awaits a wealth of historic epidemiology in the hieroglyphics of thousands of unread papyrus scrolls, cuneiform tablets, and undeciphered Arabic texts. It was with rare and generous access to many of the world's oldest medical archives and most sensitive archaeological sites in England, Scotland, North and Central America, Nine additional countries in Europe, Asia—including Russia and China, the Middle East, North and Sub-Sahara Africa, and South America including the Amazon Basin, that expanded the collection to more than 11000 entries.

Some of the findings were generally vague and others appeared to have lost the true depth of description that the physician first recorded. Often the physical sign only needed to be correlated to a particular epoch and the significant meaning of the phenomenon became clear.

There are distinctive historical periods that were followed with scores of descriptions of physical signs. These were due primarily to translations of the original works into a mainstream medical language. The first was when Ambroise Paré translated sections of Andreas Vesalius's 1543 anatomy text *De Fabrica Corporis Humani* into French for inclusion in his 1561 edition of *Anatomie Universelle du Corps Humain*, to be used as a teaching text. The next was at the beginning of the nineteenth century, when in 1808 Napoleon's physician, Baron Jean Nicolas Corvisart des Marets, translated Josef Leopold Elder von Auenbrugger's 1761 essay on the percussion technique, *Inventum novum ex percussione thoracis humani et signo abstrusos interni pectoris morbos detegendi,* from Latin into French, and then the world took notice. More signs were soon to follow with René-Théophile-Hyacinthe Laënnec's 1816 invention of the revolutionary stethoscope and his 1819 essay on the principles of auscultation titled, *De l'Auscultation Médiate ou Traité du Diagnostic des Maladies des Poumons et du Coeur*, translated into four English editions by Sir John Forbes, between 1821 and 1834. Following on these advances, it was then Pierre Charles Alexandre Louis that developed the methods of clinical instruction to be used in hospitals. His 1825 book on tuberculosis is excellent and should be a tool in today's struggles with the resurgence of the disease. This great work with his other writings, like the 1829 book on fever and his 1834 *Essay on Clinical Instruction* brought to the forefront the value and significance of objective physical signs verses the patient's variable symptoms. Medical instruction from that point evolved and was enhanced with the clinician's identification and interpretation of these new delineated pathological signs. What followed next was monumental, when on April 29th, 1878 Louis Pasteur appeared before the French Academy of Sciences and read his famous treatise *The Germ Theory and its Applications to Medicine and Surgery*. Until that point advances in epidemiology were rare and often dismissed. One very early finding of keen importance is the 1546 publication of *De Contagione et Contagiosis Morbis*, which was the original Germ Theory of Contagion by the Italian physician, Girolamo Fracastoro. His astute findings were put into broad use in the form of the quarantine guidelines against the plague. After the 1500's however, there was only sporadic support for the germ theory. These rare instances included a few random reports buoyed by evidence and even what appears as a confirmation in 1854 by London physician, John Snow while investigating cases of cholera. But again somewhat sadly, lost to history. However, Pasteur's seemingly new breakthrough and Robert Koch's respective discoveries would now force the resistant medical community to focus on the true causes of diseases and look to prevention as a way of reducing mortality. Another huge surge in clinical observations came after Wilhelm Conrad Röntgen's 1895 use of x-rays, earning him the Nobel Prize in Physics and then a year later Scipione Riva-Rocci's demonstration of the sphygmomanometer. Interestingly in the twentieth century, a decreased reliance on physical signs appears with the dramatic progress of modern laboratory screening tests

and multidimensional resonance imaging. Here we see the clinician's diagnostic skills of observation start to fade into the past. This presents a disturbing trend, as each year compacts populations denser, and new and old pathogens emerge with increased virulence. In aversion of letting the past heritage of medical practice become lost forever, we need to look more closely at these important historic medical findings.

With that in mind, as the collection entries were investigated in relation to the diagnostic epochs from which they arrived, they were also researched as to the relevance of the geographic location of where the sign was first observed. These details were then placed within the framework of the existing language and cultural differences of the time. This information was then compared to the prevailing epidemiology of that period.

If we carefully examine the clinical manuals used today in twenty first century medical curriculums, it demonstrates that many of the physician's original classic descriptions of these most important objective medical findings have been supplanted or lost all together. It follows here, as a case in point example, to observe how each sign collected for the atlas was carefully analyzed. An interesting example, is to follow the research notes of Kernig's sign, a serious clinical finding for meningitis. Some forms of meningitis can be lethal within just a few hours, therefore early discovery of any clinical signs and treatment are absolutely critical. Even as early as the 15th century, Hippocrates noted that fever and difficultly swallowing with a flexed neck, is a fatal sign and in the mid 1600's Thomas Willis an English anatomist and neurologist published the findings that meningitis was in fact a distinct disease process. Currently there are multiple interpretations in current university teaching and medical texts that describe how to perform Kernig's important diagnostic test. Three of the more prevalent definitions of the physical sign all convey: "That when a patient is supine (in the dorsal decubitus position) and the thigh is flexed upon the abdomen in a right angle with the trunk, extending the leg on the thigh completely cannot be done easily." (Medline) (Stedman) (Webster) What an invaluable and practical medical sign, simply have the patient lie down and lift their knee up to the stomach and extend the leg. One would believe this quick test has saved countless lives, the problem is it's not Kernig's sign. If we look critically at the origin of this classic description, we find answers on how it may have changed through history. The investigation reveals that Vladimir Mikhailovich Kernig was a Russian-Baltic German neurologist practicing in St. Petersburg, Russia in the 1880's, while bacteriology was still in development. His research and observations on meningitis were published in 1882 under the title *Ein Krankheitssymptom der acuten Meningitis,* St Petersb Med Wochensch 7:398, and later translated into Russian, again German, then French and English. His actual first hand description reads more like "I have observed for a number of years in cases of meningitis a symptom which is apparently rarely recognized although, in my opinion, it is of significant practical value. I am referring to the occurrence of flexion contracture in the legs or occasionally also in the arms which becomes evident only after the patient sits up. Then the stiffness of neck and back will ordinarily become much more severe and only now will a flexion contracture occur in the knee and occasionally also in the elbow joints. If one attempts

to extend the patient's knees one will succeed only to an angle of approximately 135 degrees. In cases in which the phenomenon is very pronounced the angle may even remain 90 degrees." (Kernig 1882) This is obviously a different definition as compared to the references used in current medical textbooks. In one profound respect, the patient is required to be sitting to complete this examination, not lying on their back, as three of the modern definitions require. This is a key part of making the diagnosis, as the sitting posture makes the stiffness of the neck and back more severe, which would support the belief that this would make the test more sensitive and accurate in it's original form. This diagnostic error may have materialized due to the description of other signs indicating meningitis which appeared around the same period. Most notably the neck and reflex signs described by Polish paediatrician Józef Brudziński. His neck sign requires the patient to be lying on their back and the neck is forcibly flexed forward causing reflex flexion of the knees and the reflex sign occurs when the patient is lying on their back and passive flexion of one knee into the abdomen results in flexion of the opposite hip and knee. Both of these signs are indicative of meningitis, subarachnoidal haemorrhages, and possibly seen in encephalitis. In respect to those descriptive similarities, Dr. Kernig and Dr. Brudziński both studied in Russia at the University of Dorpat, adding even more convergence of the historic interpretations detailing the maneuvers that reveal these findings. To date, these signs are still being studied and it appears that the accuracy of the clinical examination in those studies would seriously be in question, primarily because as the research for this atlas has revealed, there are discrepancies on how to perform Kernig's test. During Kernig's tenure in the 1880's, the clinical archives of epidemiology from St. Petersburg now reexamined, confirmed the major causes of meningitis were the Gram-positive, alpha-hemolytic, diplococcus bacterium, *Streptococcus pneumoniae* and the Gram-positive, aerobic bacterium, *Mycobacterium tuberculosis*. Both of these bacterial pathogens are known to produce an intense pachymeningitis around the brain stem. With this cardinal feature of inflammation concentrated toward the base of the brain, the motor root nerves become irritated with increased tension as they pass through the inflamed meninges, thus the physiology associated with the sign is intensely accurate. Today however, viral meningitis emerges as the most common form seen with a decreased inflammation of the dura mater. Without that level of pachymeningitis, Kernig's classic sign may be absent in the viral forms of meningitis. This brings forth the question of the sign's sensitivity. Brudziński originally diagnosed 42 cases of meningitis with a sensitivity of 97 percent, while Kernig's phenomenon was shown to have had a sensitivity of 57 percent. Again, one has to question the accuracy of the clinical exam combined with other findings like fever, headache or altered mental status. Being aware that Kernig's sign is more specific toward a diagnosis of bacterial meningitis and it's absolute mortality without treatment, greatly enhances the patient's survivability. Ultimately this is the reason for creating this atlas.

One hopes that a clinician would find great value in connecting with the physician's original observations and gleaning insight from their historic findings. The doctor's original unsung research findings may represent a major contribution to the complex

discipline of medicine and be an excellent example of the clinico-pathologic method. Many diagnostic procedures from medical history have been forgotten or lost and others remain, but are yet to be understood. This is often an occurrence when multiple translations emerge from a relatively obscure publication. It was no surprise to discover words and phrases used in many of the ancient references for this atlas that have no meaning in English or a synonym in the other scientific languages of French or German. There are also many accepted spellings of the same word and if that spelling was used repeatedly in a certain form by the original author, then that was adhered to in the modern description. There are several entries that at first appear to be recast, this is most often due to the sign being an eponym, and appearing in several references with one spelling and then appearing again in multiple references of the same time period with nearly the same orthography, but for accuracy of the physician's name both forms are defined. Though rare, there were also disagreements about certain translations and when that occurred, the entry is presented in it's original language. Several of the landmark papers that illustrate the scientific method had suffered as well from multiple translations. Finding the original paper and often the physician's notes and letters to colleagues helped see their perspective and relieved considerable confusion relating to the mistranslations. This detailed style of investigation parallels similar researches on the Old Testament translations of God's word, from Masoretic Hebrew and Koine Greek to Latin, then German, and so forth. With each translation and assertion, the work produced will receive criticism and generate controversy. It is with that carefully in mind that great care has been taken to reproduce and convey the physician's superb intent and classic clinical descriptions. All references are in the prominent inline style and detailed in the reference list at the end of the publication. Permission was granted to use pre published materials from the copyright holders and clear acknowledgment is made in the bibliography of reference sources and in the permissions and copyrights section. Therefore in conclusion let us consider the classic words of Oliver Wendell Holmes, "Let the men who mould opinions look to it! If there is any voluntary blindness, any interested oversight, any culpable negligence, even in such a matter and the facts shall reach the public ear, the pestilence-carrier of the lying-in chamber must look for God for pardon, for man will never forgive him." (Holmes 1855)

F. A. White
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SECTION ONE

White's Atlas of Physical Signs in Medicine and Surgery

Aaron's sign, [Charles Dettie Aaron, American physician, 1866-1951] the sensation of pain or discomfort exhibited in the precordial or epigastric region when pressure is applied over McBurney's point. A sign of appendicitis. (Aaron 1913) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Aarskog sign, stunted growth with facial, digital, and genital abnormalities. Also known as faciodigitogenital syndrome. (*ARPS* 1990) (*Genetic*) (*Renal Reproductive*) (*Muscular Skeletal*) (*Oral Maxillofacial*) (*Neurologic*)

Abadie's sign, 1. [Charles Abadie, French ophthalmologist, 1842-1932] a spasm of the levator palpebrae superioris muscle. A sign of exophthalmic goiter, also known as Graves' disease. 2. [Joseph Louis Irénée Jean Abadie, French neurologist, 1873-1946] decrease or loss of sensitivity of the Achilles tendon to pressure. A sign of tabes dorsalis. (Abadie 1905) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Ophthalmic*) (*Infectious disease Immunology*) (*Neurologic*) (*Otolaryngology*)

Abbot's Relief sign, [William Abbot, London physician, 1831—] relief from the severe pain associated with an infected tooth after a mixture of morphine, arsenous acid, and creosote have been placed within the pulp chamber. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Neurologic*)

Abbott's sign, [Edville G. Abbott, American orthopaedic surgeon, 1872—] lateral curvature of the spine. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Abderhalden's sign, [Emil Abderhalden, German physiologist, 1877—] the presence of protective ferments in the blood. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*)

Abdominal sign, contractions about the navel on sharp downward friction of the abdominal wall. It indicates that the spinal cord from the eighth to the twelfth dorsal nerve is intact. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Abdominocardiac sign, any reflex in the heart produced by stimulating the abdominal sympathetic nerves. Also called Livierato's and Prevel's sign. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Abercrombie's sign, [John Abercrombie, Scottish physician, 1780-1844] amyloid degeneration. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Gastrointestinal*)

Ablution sign, bilharzia parasite infection from ablution pools in mosques. Also known as Yemen sign. (*ARPS* 1990) (*Infectious disease Immunology*)

Abrahams' sign, [Robert Abrahams, American physician, 1861-1935] 1. percussion over the acromion process produces a sound described as between flat and dull. A sign of early *Mycobacteruim tuberculosis* within the apex of the lung. 2. pain exhibited when pressure is applied midway between the ninth right costal cartilage and the umbilicus. A sign of vesical lithiasis. (Abrahams 1913) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*) (*Renal Reproductive*)

Abrams' Heart sign, [Albert Abrams, American physician, 1863-1924] contraction of the myocardium which results when the skin of the precordial region is irritated. It is observed with the fluoroscope. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Cardiovascular*)

Abrams' Lung sign, [Albert Abrams, American physician, 1863-1924] reflex contraction of the lung following stimulation of the chest wall. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Abstinence sign, withdrawal symptoms or signs. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Accessory sign, the existence of any nonpathognomonic objective finding as a sign of disease. Also known as Assident sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990)

Accommodation sign, the dilatation or contraction of the pupil in accommodation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Acephalus sign, a partially formed fetus described as a headless monster. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Acetanilide sign, blueness of face and lips with faintness. A sign of poisoning with acetanilide. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Poisoning*)

Achilles sign, contraction of the calf muscles excited by a blow upon the Achilles tendon producing a flexion of the foot. The triceps surae jerk. Also called the Tendo Achilles Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Acid Burn sign, burning in the mouth and throat with vomit containing white lumps of mucous and altered black or brown blood. Possible staining of lips, skin or clothing from the acid. A sign of poisoning with a strong mineral acid. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Otolaryngology*) (*Dermatologic*) (*Gastrointestinal*)

Acne Cornee sign, contagious follicular keratosis. Also called ichthyosis sebacea cornea. (Leloir and Vidal) (Wilson) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Aconite sign, prickling and tingling sensations with giddiness and possible numbness in the mouth. The prickling feeling spreads on to the face and then to the whole body. A sign of aconite or aconitine poisoning. Also known as Monkshood sign. (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Poisoning*)

Acromial sign, slight flexion of the forearm with slight internal rotation of the hand on tapping the acromion or coracoid process. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Adams's sign, [Robert Adams, Irish physician, 1791-1875] permanent bardycardia with attacks of syncope and epilepsy, due to arteriosclerosis of the basilar and vertebral arteries. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Adams-Stokes's sign, [Robert Adams, Irish physician, 1791-1875, William Stokes, Irish physician, 1804-1878] permanent bardycardia with attacks of syncope and epilepsy, due to arteriosclerosis of the basilar and vertebral arteries. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Addison's sign, [Sir Thomas Addison, English physician, 1795-1860] a disease characterized by bronze-like pigmentations of the skin, severe prostration, and

progressive anemia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Endocrine*) (*Hematologic*)

Addison's Oral sign, [Sir Thomas Addison, English physician, 1795-1860] hyperpigmentation of the buccal mucosa due to lack of adrenal cortical control over the pituitary secretion of melanocyte stimulating hormone. (*ARPS* 1990) (*Dermatologic*) (*Endocrine*) (*Oral Maxillofacial*)

Addison's Palm sign, [Sir Thomas Addison, English physician, 1795-1860] characteristic pigmentation in the creases of the hand as a sign of Addison's disease. (*ARPS* 1990) (*Dermatologic*) (*Endocrine*)

Adductor sign, on tapping the tendon of the adductor magnus with the thigh in abduction, contraction of the adductors results. (*ARPS* 1990) (*IMD* 1974) (*Muscular Skeletal*) (*Neurologic*)

Adductor Reflex of the Foot sign, adduction, inversion, and slight plantar flexion of the foot on stroking the inner aspect (not the sole) of the foot from the great toe to the heel; called also adductor reflex of foot. Also called Hirschberg's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

AEM sign, angiostrongylus eosinophilic meningitis, low grade fever, severe headache, and vomiting. This is due to the ingestion of the zoonotic *Angiostrongylus cantonensis* roundworm larvae, found in snails, shrimp, molluscs, crabs, fish, frog, lizards, and some vegetable contamination. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*) (*Hematologic*) (*Neurologic*)

African Horse sign, copious fluid discharge, fever, edema of the head, and fatal pneumonia, in mules and horses. The disease exists in four distinct forms, two of which are usually fatal. Caused by an orbivirus. Also called the equine plague and *pestis equorum*. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Ahlfeld's sign, [Johann Friedrich Ahlfeld, German gynaecologist, 1843-1929] 1. irregular tetanic spasms of portions of the uterus after the third month of gestation. 2. the appearance of the umbilical cord in the vulva cavity after delivery, as it moves away the placenta is advancing downward. A sign of loosening of the placenta. (Ahlfeld) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Ainhum sign, spontaneous amputation of the little toe. A pathologic process which causes ingrowth of the epithelium and the toe falls off at the fifth or less common the fourth phalanx at the interphalangeal joint. Also called *ainham* or *quigila* in Portugese,

and the Hindoo name *sukha pakla*. (Pyle 1895) (Lima and Seixas) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Air-cushion sign, often in radiology of chronic appendicitis there is the indication of tympanites in the lower right quadrant. Also known as Klemm's sign. (*IMD* 1974) (*Gastrointestinal*)

Ajax sign, severe deep noncarious erosion on the buccal surface of the teeth often extending to the pulp chamber. A sign seen in the use of an extremely abrasive dentifrice, often Ajax powder. Also known as Armstrong's sign. (*ARPS* 1990) (*Oral Maxillofacial*)

Albarrán's sign, [Joaquin Albarrán Maria y Dominguez, Cuban born French urologist, 1860-1912] Hémorragie survenant au cours du cathétérisme urétéral, lorsque le liquide injecté distend le bassinet : signe de cancer de bassinet. A sign of pelvis renalis carcinoma. (Albarran 1891) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Oncology*)

Albert's sign, achillobursitis. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*)

Alcoholism Burn sign, the characteristic burn from a cigarette occurring between the fingers after the person has fallen into a deep alcoholic sleep. (*ARPS* 1990) (*Dermatologic*) (*Poisoning*) (*Neurologic*)

Alibert's sign, [Jean Louis Marc Alibert, French dermatologist, 1768-1837] mycosis fungoides. (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Alien's sign, used in reference to the belief that aliens visiting from space caused the malignancies diagnosed in the rural populations of North Carolina, Tennessee, Virginia, and West Virginia. Areas dense in military and classified government facilities. Patients though afraid to report sightings will certainly confirm that they "got cancer from the aliens." (*ARPS* 1990) (*Neurologic*) (*Oncology*)

Allied Reflexes sign, reflexes in which two afferent stimuli use the same common pathway or produce effects on two synergistic muscles. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Alligator sign, ichthyosis, morbid development of the papillae and thickening of the epidermic lamellae in which the thick scales exhibit a greenish-black hue, as if the patient has the skin of an alligator. Also called Martin's sign. (Martin) (Taylor) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Allis's sign, [Oscar Huntington Allis, American surgeon, 1836-1931] the relaxation of the fascia lying between the greater trochanter muscle and the crest of the ilium. A sign indicating a fracture of the neck of the femur. (Allis) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Amelus sign, a partially formed fetus described as a monster without arms or legs. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

American Plague sign, mouth feels swollen, bloodshot eyes, bradycardia, black vomit and kidney pain. A sign indicating yellow fever. Caused by the zoonotic mosquito-borne yellow fever virus. Baboons and monkeys are known hosts. Mortality can be as high as 50 percent. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Renal Reproductive*) (*Oral Maxillofacial*) (*Ophthalmic*) (*Death*)

Amoss's sign, [Harold Lindsay Amoss, American physician, 1886-1956] when the patient rises to a sitting posture from lying in bed, he must support himself with his hands placed far behind him in the bed. A sign indicating flexure of the spine is painful. (Amoss) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Ampicillin Mono Rash sign, the appearance of an irritating rash of macular and papular form seen in sensitivity to ampicillin, often indicates the patient has infectious mononucleosis, because the rash appears more frequently in patients with infectious mononucleosis that have been treated with ampicillin. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Anal Reflex sign, contraction of the anal sphincter on irritation of the skin of the anus. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Dermatologic*) (*Gastrointestinal*)

Anaphylactoid sign, pseudoanaphylaxis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Ander's sign, [James M. Anders, American physician, 1854—] adiposis tuberosa simplex. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Andernach's sign, [Johann Winther von Andernach, German physician, 1478-1574] wormiam bones. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Andersch's sign, [Carl Daniel Andersch, German anatomy professor, 1732-1777] a form of hearing loss from damage to the tympanic nerve. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Anderson's sign, clumps of red blood cells in the stools of amoebic dysentery; seen on microscopic examination. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Hematologic*)

Andouard's sign, blue bile, blue flakes in vomit. (Andouard 1878) (*AACM* 1896) (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Andra's sign, [Gabriel Andral, French physician, 1797-1876] when a patient lies on the sound side, also known as decubitus on the sound side. An early sign of pleurisy. Also known as Andral's decubitus. (Andral 1821) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Dermatologic*)

André Thomas sign, [André Antoine Henri Thomas, French physician, 1867-1963] during the finger to nose test, the patient is directed to raise his arm over his head and then ordered to let it drop to his head, if the arm rebounds, this is a sign of disease of the cerebellum. (Thomas 1900) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Andreasen's sign, [Anthony Turner Andreasen, Indian surgeon] a thrill is present on coughing with a cystic swelling of the thoracic wall, but absent in aneurysm. (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Anghelescu's sign, [Constantin Anghelescu, Roumanian surgeon, 1869-1948] when the patient is unable to bend the spine or lift his body, while lying on the back, so that he is resting only on his head and heels. A sign of tuberculosis of the vertebrae. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Angiospasmodic sign, a disease marked by spasms of the various vessels of the body. (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*)

Angular sign, lesion in the corner of the mouth, termed angular cheilosis, may result from a decrease in vertical dimension, as well as, vitamin B complex deficiency. (*ARPS* 1990) (*Oral Maxillofacial*) (*Nutritional*)

Aniline sign, blueness of face and lips with drowsiness. A sign of aniline or aniline oil poisoning. (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*) (*Dermatologic*)

Ankle sign, pressure on the sole with flexion of the foot causes clonic contraction of the tendo Achillis. Also called Ankle-clonus. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Annam sign, oriental boil. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Annandale's sign, [Thomas Annandale, Scotch surgeon, 1838-1907] knock-knee. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Anserine sign, a disease marked by emaciation of the extremities, causing the hands and feet to resemble a goose's extremities. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*)

Anstie's sign, [Francis Edmund Anstie, English physician, 1833-1874] alcohol poisoning. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Hematologic*)

Antagonistic sign, reflex movements occurring not in the muscle which has been stretched but in its antagonist. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Antecedent sign, precursory evidence or indication for oncoming disease. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990)

Anterior Drawer Sign, a test to check for rupture of the cruciate ligament of the knee. With the leg flexed at 90 degrees the tibia is then pulled forward, if it does move more than normal, this indicates rupture. Also known as Drawer sign. (*ARPS* 1990) (*Muscular Skeletal*)

Anterior Tibial sign, the involuntary contraction of the tibialis anterior muscle exhibited when the thigh is forcibly flexed toward the abdomen. A sign of spastic paraplegia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Anthrax sign, a virulent circumscribed boil with relatively little pain and an absence of pus. A sign of cutaneous anthrax. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Antichrist sign,—and with the arrival of a man with black lips, it will be the beginning of the end. This is an occult belief where the man will bring destruction in the form of disease or political oppression, respectively as a carrier of the Bubonic Plague or with his cult of personality promise wealth to the lazy and weak minded only to enslave them in a form of Totalitarianism. Black lips are a classic indication of an infection with *Yersinia pestis*. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Anticus sign, [Alexander Piotrowski, German neurologist, 1878—] excessive dorsal flexion and supination of the foot elicited by percussion of the anterior tibialis muscle. A sign indicating organic disease of the central nervous system. Also known as anterior reflex, anticus reflex or Piotrowski's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Antimony sign, strong metallic taste, hot sensation in mouth and throat with intense nausea and purging with blood. A sign of poisoning with antimony. See also

Perpetual Pill sign. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Otolaryngology*)

ANUG sign, [Henri Vincent, French physician, 1862-1950] painful acute necrotizing ulcerative gingivitis, also known as ulceromembranous gingivitis, Vincent's infection, Vincent's War sign, and Trench Mouth sign. See HIVP, LGE, and NUP signs. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Apocryphal McBurney's sign, a syndrome that closely resembles appendicitis that is due to the ingestion of slugs or items contaminated by their slug trail secretion. This abdominal pain is caused by the zoonotic *Parastrongylus costaricensis* nematode. Also called angiostrongyliasis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Apple Jelly sign, press a glass slide firmly over an unknown cutaneous ulceration and if apple-jelly-like nodules become apparent, this is a sign of *lupus vulgaris*. (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Aqueous-influx sign, entrance into conjunctival or subconjunctival vessels of clear fluid (aqueous humor), deriving from an aqueous vein during compression of its recipient vessel. Formerly called *glass-rod phenomenon,* because of resemblance of the aqueous-filled vessel to a glass rod. Also called blood-influx phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*)

Archibald's sign, [Robert George Archibald, British surgeon, 1880—] a fever with drowsiness occurring in Sudan. Caused by the *B. cloacoe* group microorganism. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Argyll Robertson Pupil sign, [Douglas Moray Cooper Lamb Argyll Robertson, Scotch physician, 1837-1909, Henri Vincent, French physician, 1862-1950] a pupil which is miotic and responds to accommodation effort, however it does not respond to light. Pathognomonic of neurosyphilis. Also known as Vincent's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*)

Argyria sign, a blue black deposit of silver in the skin, caused by exposure to silver dusts or salts. Often appears as a gray blue haze in the white of the eye. Also known as Silver Eye sign. (*ARPS* 1990) (*Poisoning*) (*Dermatologic*) (*Ophthalmic*)

Arlt's sign, [Ferdinand Ritter von Arlt, Viennese ophthalmologist, 1812-1887] trachoma, granular conjunctivitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*)

Armadillo sign, paternal hereditary ichthyosis, morbid development of the papillae and thickening of the epidermic lamellae. Also called Pettigrew's sign. (Pettigrew 1832) (Ascanius) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Armadillo Plague sign, [Texas, Louisiana] refers to possible zoonotic transmission of leprosy to humans. The bacterium *Mycobacterium leprae* has been found in the armadillo, cynomolgus macaque, chimpanzee, and the sooty mangabey. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Armstrong's sign, severe deep noncarious erosion on the buccal surface of the teeth often extending to the pulp chamber. A sign seen in the use of an extremely abrasive dentifrice, often Ajax powder. Also known as Ajax sign. (*ARPS* 1990) (*Oral Maxillofacial*)

Armstrong's Rectal sign, the discharge of fetal bones or an extrauterine fetus by the rectum. (Armstrong 1835) (*AACM* 1896) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*)

Army's sign, c. 1860's, morphine addiction. (*ARPS* 1990) (*Neurologic*)

Arroyo's sign, [Carlos F. Arroyo, American physician, 1892-1928] a condition in which the normal pupillary light reflex is sluggish. A sign of hypoadrenalism. Also known as asthenocoria. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Arsenic sign (acute), severe spreading stomach pain with possibly vomiting black from soot or blue from indigo. Intense thirst, cramps, and coma. Also known as Paris Green sign and Sheep Dip sign. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Arsenic sign (chronic), a classic sign of chronic arsenical poisoning, in which the palms and the soles of the feet have a leathery texture. Also known as Leathery Palm sign. (*ARPS* 1990) (*Poisoning*) (*Dermatologic*)

Arsenical Gas sign, intensely painful nasal mucous membrane, mental distress, sneezing, followed by the throat, mouth, gums, and teeth burning with acute pain. A sign of exposure to arsenical gas. Also known as Cayenne sign. (*ARPS* 1990) (*Poisoning*) (*Otolaryngology*) (*Oral Maxillofacial*) (*Neurologic*)

Arthus's sign, [Maurice Arthus, French bacteriologist] a phenomenon of anaphylaxis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Arum Maculatum sign, purging, cold clammy skin, with swelling of the tongue. Indicates poisoning from arum maculatum. Also known as Cuckoopint sign. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Dermatologic*)

Ascending Guillain-Barré sign, gastroenteritis and lower neuron paralysis which ascends often with paresthesia. Caused by parasitic tick neurotoxins spread during the blood meal. Also called tick paralysis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Poisoning*) (*Neurologic*)

Asch's sign, [Morris J. Asch, American otolaryngologist, 1833-1902] deviated nasal septum. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*)

Aschner's sign, [Bernhard Aschner, Austrian gynaecologist, 1883-1960] the slowing of the cardiac rhythm following pressure on the carotid sinus or compression of the eyes. If the rate slows from 5 to 13 beats per minute it is considered normal. If the rate slows from 13 to 50 or more beats per minute this is considered exaggerated. If the rate slows from only 1 to 5 beats per minute this is considered diminished. If the cardiac rhythm accelerates due to the ocular compression, this reflex is called inverted. The slowing of the pulse on pressure of the eyeball is a sign of cardiac vagus irritability. Also known as Aschner's reflex, Aschner's phenomenon, eyeball compression reflex, eyeball-heart reflex or oculocardiac reflex. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*) (*Neurologic*)

Ashton's sign, engaged eye to eye contact, smiling and early verbal skills in infants. A sign of high intelligence. An absence of this sign before age one may indicate an autism spectrum disorder. (White 2009) (*Neurologic*)

Assam's sign, chloasma uterine, during pregnancy the skin can become bronze with black spots like a leopard, a pernicious form of malaria. (Assam 1884) (Kaposi) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*) (*Dermatologic*) (*Infectious disease Immunology*)

Assident sign, the existence of any nonpathognomonic objective finding as a sign of disease. Also known as Accessory sign. (*IMD* 1974) (*ARPS* 1990)

Ataxic Gait sign, gait of tabes. (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Athetosis sign, inability to retain the fingers and toes in any position in which they might be placed, because they are in continuos motion. (Hammond 1871) (Drewry 1895) (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Atriopressor sign, rise in arterial blood pressure (vasoconstriction) attributed to a change of pressure in the right atrium and great veins. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Atropine sign, severe dry mouth, loss of voice, dilatation of the pupils, suppression of urine, sight and hearing hallucinations. A sign of atropine poisoning. Also known

as Belladonna and Nightshade sign. (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Renal Reproductive*) (*Otolaryngology*) (*Ophthalmic*) (*Oral Maxillofacial*)

Attention Reflex sign of Pupil, alteration of size in the pupil when the attention is suddenly fixed. Also called Piltz's reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Attitudinal sign, those reflexes having to do with the position of the body. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Aubert's sign, [Hermann Aubert, German physiologist, 1826-1892] by an optic illusion, when the head is turned toward one side a vertical line appears to incline toward the other side. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Auchincloss' sign, [Hugh Auchincloss, American surgeon] visible signs of carcinoma of the breast become more apparent, when the arms are raised above the head. (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*)

Audito-oculogyric sign, a turning of both eyes in the direction of a sudden sound. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Auditory sign, any reflex caused by stimulation of the auditory nerve, especially momentary closure of both eyes produced by a sudden sound. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Auenbrugger's sign, [Leopold Elder von Auenbrugger, Austrian physician, 1722-1809] a bulging of the epigastrium. A sign of extensive pericardial effusion. (Auenbrugger 1761) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Gastrointestinal*)

Auer's sign, [John Auer, American physician, 1875-1948] inflammation or necrosis in the ear of a rabbit that is rubbed with Merck's xylol shortly after the rabbit receives its second intraperitoneal injection of horse serum-the rabbit having previously been sensitized. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Aufrecht's sign, [Emanual Aufrecht, German physician, 1844-1933] a feeble breathing sign heard just above the location of the jugular fossa. A sign of tracheal stenosis. (Aufrecht 1881) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Otolaryngology*)

Aural sign, any sign or reflex connected with the auditory apparatus. Aural signs and reflexes of compensation are: 1. those of the labyrinthine escapement. 2.

those of vasomotor compensation. 3. those of tympanic compensation. 4. those of tubotympanic compensation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Auricle sign, involuntary movement of the ear produced by auditory stimuli. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Auricular Leprosy sign, thickening of the greater auricular nerve where it crosses the sterno mastoid muscle. A sign of tuberculoid leprosy. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Muscular Skeletal*)

Auriculocervical Nerve sign, unilateral congestion of the ear upon stimulation of the distal end of the divided auriculocervical nerve. Also called Snellen's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Auriculopalpebral sign, closure of the eye as a result of tactile or thermal stimulation of the deepest part of the external auditory meatus and tympanum. Also known as Kehrer's and Kisch's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*) (*Ophthalmic*)

Auspitz's sign, [Heinrich Auspitz, Austrian dermatologist, 1835-1886] A characteristic, point-shaped bleeding after removal of a dermatologic scale. A sign psoriasis. Also known as Auspitz's symptom. (Auspitz 1870) (*ARPS* 1990) (*Dermatologic*)

Austin Flint sign, [Austin Flint, American physiologist, 1812-1886] Flint murmur or phenomenon. (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*)

Australian Blight sign, angioneurotic edema. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Autism Spectrum Disorder signs, poor eye contact, does not speak before age one, doesn't smile, does not respond to name, lack of pointing and gesturing and lack of social and emotional reciprocity. Also known as a negative Ashton's sign of intelligence. (*ARPS* 1990) (*Neurologic*)

Autokinetic Visible Light sign, the apparent spontaneous movement of a pin-point source of light as seen by certain susceptible persons when they gaze steadily at it in a completely blacked-out room. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Autonomic sign, a response of smooth muscle, glands, and conducting tissue of the heart, which alters the functional state of the innervated organ. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Avellis's sign, [Georg Avellis, German otolaryngologist, 1864—] unilateral paralysis of the velum palati and larynx. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Neurologic*)

Avicenna's sign, [Abu Ali al-Husayn ibn Abd Allah ibn Sina, Persian physician, c. 980-1037] encapsulated tumor. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*)

Axenfeld's sign, [David Axenfeld, German physiologist] albumin in urine. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Axhausen's sign, [Georg Axhausen, German surgeon, 1877-1960] signe d'ostéochondrite disséquante du genou: le genou étant en flexion forcée, il existe une douleur à a la pression entre le bord de la rotule et la face axiale du condyle interne. (Axhausen 1909) (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Axon Reflex sign, a reflex resulting from a stimulus applied to one branch of a nerve which sets up an impulse that moves centrally to the point of division of the nerve where it is reflected down the other branch to the effector organ. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Ayerza's sign, Osler's disease of the spleen and liver with hyperplasia of the bone marrow. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*)

Babes' sign, [Victor Babes, Romanian physician, 1854-1926] fever and hemolytic anemia. Caused by the bite of the *Ixodes* ticks infected with protozoal *Babesia*. (*ARPS* 1990) (*Infectious disease Immunology*)

Babinski's sign, [Joseph François Félix Babinski, French neurologist, 1857-1932] 1. the loss or lessening of the Achilles tendon reflex. A sign of sciatica, used to differentiate it from hyteric sciatica. 2. in lesions of the pyramidal tract there is dorsiflexion of the big toe on stimulating the sole of the foot. A sign of organic hemiplegia, used to differentiate it from hysteric hemiplegia. Also known as Babinski's reflex, Babinski's Toe sign or toe sign. 3. the patient is asked to open their mouth and whistle or blow air and the contraction of the platysma muscle on the healthy side is more vigorous than the affected side. A sign of hemiplegia. 4. when a patient makes an effort to rise to a sitting position without use of his arms or has his arms crossed upon his chest, the heel on the paralyzed side lifts from the ground, due to the thigh is flexed upon the pelvis. The limb on the healthy side does not move. This phenomenon repeats when the patient attempts to return to a supine posture. A sign of organic hemiplegia, but not seen in hysterical hemiplegia. 5. a patient's paralyzed forearm is placed in supination, but then turns over to pronation. A sign of organic paralysis. Also known as pronation

sign. (Babinski 1896) (*TAIMD* 1909) (Babinski 1917) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Babinski's Toe sign, [Joseph François Félix Babinski, French physician, 1857-1932] in lesions of the pyramidal tract there is dorsiflexion of the big toe on stimulating the sole of the foot. A sign of organic hemiplegia, but not seen in hysterical hemiplegia. Also known Babinski's reflex, Bainsksi's sign, or Toe sign. (Babinski 1896) (*TAIMD* 1909) (Babinski 1917) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Baccelli's sign, [Guido Baccelli, Italian physician, 1832-1916] aphonic pectoriloquy. A sign of pleural effusion. (Baccelli 1875) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Bad sign, syphilis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Baelz's sign, [Edwin von Baelz, German physician, 1849-1913] a disease characterized by painless ulcerating papules of the mucous membrane of the lips. (*TAIMD* 1909) (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*)

Bagginess sign, bagginess under the eyes as signs of myxoedema and nephritis. Often seen as a sign of debauchery related to certain lifestyles. (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Renal Reproductive*)

Baghdad Boil sign, [Iraq] fever, pancytopenia, hepatosplenomegaly, caused by a zoonotic transmission of the protozoal *Leishmania* species by the bite of phlebotomine sand flies. The disease can exist in visceral, cutaneous, and mucosal forms. Also known as the Balkan Sore. (*ARPS* 1990) (*Infectious disease Immunology*)

Baillarger's sign, [Jules Gabriel François Baillarger, French psychiatrist, 1815-1890] the inequality of the pupils. A sign of paralytic dementia. (Baillarger 1840) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Bainbridge Reflex sign, [Francis Arthur Bainbridge, English physiologist, 1874-1921] rise in pressure in, or increased distention of, the large somatic veins or the right atrium, with acceleration of the heart beat. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Baker's sign, [William Morrant Baker, English surgeon, 1839-1896] a sac of synovial fluid outside of the joint. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Balance's sign, [Sir Charles Alfred Ballance, British surgeon, 1856-1936] when the patient lies on their left side, resonance is detected in the right flank. A sign of splenic rupture. (Ballance 1908) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*)

Balfour's sign, chloroma or chlorosarcoma. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*)

Balkan Sore sign, [Balkans] fever, pancytopenia, hepatosplenomegaly, caused by the zoonotic transmission of a protozoal *Leishmania* species by the bite of phlebotomine sand flies. The disease can exist in visceral, cutaneous, and mucosal forms. (*ARPS* 1990) (*Infectious disease Immunology*)

Ballet's sign, [Gilbert Ballet, French neurologist, 1853-1916] the loss of all voluntary eye movements with ophthalmoplegia externa, but persisting pupillary and reflex eye movements. A sign seen in Graves' disease and hysteria. (Ballet 1897) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Neurologic*)

Ballingall's sign, [Sir George Ballingall, British surgeon, 1780-1855] mycetoma. Also known as Ballingal's sign, disease, and maduromycosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Ballooning sign, ballooning of the thenar eminence. A sign of an infected thenar space. (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Balne's sign, obstruction of the nasopharynx causing a cough when the patient lies down. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Balser's sign, [August Balser, German surgeon] gangrene and fat necrosis of the pancreas. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bamberger's sign, [Heinrich von Bamberger, Austrian physician, 1822-1888] 1. a condition of reversal in which, if one extremity is stimulated, the sensation is referred to the opposite side. Also known as allochiria. 2. evidence of solidification or filled with firmness at the angle of the scapula, which disappear when the patient leans forward. A sign of pericardial effusion. (Bamberger 1859) (Ewart 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Cardiovascular*)

Bamberger-Marie's sign, [Heinrich von Bamberger, Austrian physician, 1822-1888, Pierre Marie, French physician, 1853-1940] hypertrophic pulmonary osteoarthropathy.

(*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*) (*Muscular Skeletal*)

Banana sign, in sonography of the fetal skull the cerebellar hemispheres have a banana-like shape, indicating the Arnold-Chiari deformity. (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Bandicoot sign, zoonotic Queensland tick typhus. (*ARPS* 1990) (*Infectious disease Immunology*)

Bandy Legs sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] a presentation of syphilis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Banti's sign, [Guido Banti, Italian pathologist, 1852-1925] a form of splenic anemia attended with cirrhosis of the liver, hypertrophy of the spleen, and ascites. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*)

Bar Rot sign, paronychia. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Bárány's sign, [Robert Bárány, Austrian otologist, 1876-1936] 1. a patient's fall is influenced by changing the position of the patient's head. A sign of disturbances of equilibrium of the vestibular apparatus. Also known as Bárány's law or symptom. 2. if a normal ear is irrigated with hot water (115 degrees Fahrenheit) a rotary nystagmus is developed toward that ear. If cold water is used to irrigate the ear, a rotary nystagmus is developed away from that side. If there is no nystagmus this is a sign that the labyrinth is diseased. Also known as the Bárány's test or the caloric test. (Bárány 1906) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Barber Chair sign, [Jacques Jean Lhermitte, French neurologist, 1877-1959] flexing of the neck causes sudden electric shock like sensations that extend down the spine and spread into the limbs. A sign seen mainly in multiple sclerosis but also in cervical cord compression, tumors, spondylosis, and vitamin B12 deficiency. Also known as Lhermitte's sign. (Lhermitte 1924) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Oncology*) (*Nutritional*)

Barbitonum sign, lips and finger-tips blue, drooping of eyelids, and usually loss of control of bladder and bowels. An indication of barbitonum poisoning. Also known as Veronal sign. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Ophthalmic*) (*Renal Reproductive*) (*Gastrointestinal*)

Barcoo Rot sign, a skin disease with crusty sores, occurring in southern Australia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Bard's sign, [Louis Bard, French physician, 1857-1930] 1. oscillations of the eye increase as the patient's attention follows the finger moved alternately from one side to the other. A sign of organic nystagmus. 2. oscillations of the eye disappear as the patient's attention follows the finger moved alternately from one side to the other. A sign of congenital nystagmus. (Bard 1908) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Bareggi's sign, soft blood clots formed from typhoid fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Infectious disease Immunology*)

Barking Madness sign, c. 1341, an overwhelming desire to bark like a dog, sometimes dancing wildly to no music. Often accompanied with an irrational fear of demons and the need to hide from them. An indication of ergot poisoning. (*ARPS* 1990) (*Poisoning*) (*Neurologic*)

Barkman's sign, contraction of the rectus abdominis muscle on the same side after stimulation of the skin just below one of the nipples. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Dermatologic*)

Barlow's sign, [Sir Thomas Barlow, English physician, 1845-1945] infantile scurvy with spontaneous hemorrhages. (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Nutritional*) (*Hematologic*)

Barnhard's sign, [Harold Leslie Barnhard, English surgeon, 1868-1908] hectic temperature, the absence of pain, and observing pus in diaphragmatic excursions reveal the sign of a subdiaphragmatic abscess. (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Barometer-maker's sign, chronic mercurial poisoning in makers of barometers, due to the inhalation of the fumes of mercury. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Poisoning*)

Barré's sign, [Jean-Alexander Barré, French neurologist, 1880-1967] the normal contraction of the iris is retarded. A sign of mental deterioration. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Barré's Pyramidal sign, [Jean-Alexander Barré, French neurologist, 1880-1967] the patient lies face down and bends the knees to lift the legs vertically, but cannot hold this position. A sign of disease of the pyramidal tracts. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Barrel Chest sign, increased antero-posterior diameter of the thorax seen in emphysema and kyphosis. (*ARPS* 1990) (*Respiratory*)

Barth's sign, [Jean Baptiste Barth, German physician] intestinal hernia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bartholinus's sign, chromidrosis, perspiration with the color of black ink. (Bartholinus 1775) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Baruch's sign, [Simon Baruch, American physician, 1840-1921] no change of the rectal temperature, after patient has been placed in a 75 degree Fahrenheit bath for fifteen minutes. A sign of typhoid fever. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Barwell's sign, [Richard Barwell, English surgeon, 1826-1916] knock-knee. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Basal Joint sign, passive flexion of the metacarpophalangeal joint of one of the fingers causes flexion of the basal joint and extension of the terminal joint of the thumb. Also known as the Finger-thumb Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Basedow's sign, [Carl Adolph von Basedow, German physician, 1799-1854] exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Bassler's sign, [Anthony Bassler, American physician, 1876—] pinching the appendix between the umbilicus and superior spine of the ilium causing sharp pain as an indication of chronic appendicitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bastedo's sign, [W. A. Bastedo, American physician, 1873—] inflation of the colon with air, results in right iliac fossa pain. An indication of chronic appendicitis. (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bastian-Bruns' sign, [Henry Charlton Bastian, British neurologist, 1837-1915, Ludwig Bruns, British neurologist, 1856-1916] the normal tendon reflexes of the lower extremities have been abolished. A sign of a complete transverse lesion in the spinal cord cephalad to the lumbar enlargement. Also know as Bastian's law or Bastian-Bruns law. (Bastian 1890) (Bruns 1901) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Bateman's sign, molluscum contagiosum. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Battle's sign, [William Henry Battle, English surgeon, 1855-1936] postauricular ecchymosis, hemorrhage from the venous sinus follows the fracture lines and diffuses into the tissues behind the ear. Often with a livid black or blue color. Discoloration first appears near the tip of the mastoid process with ecchymosis in the line of the posterior auricular artery. A sign indicating fracture of the base of the skull. (Battle 1890) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Otolaryngology*) (*Dermatologic*)

Bauer's sign, [Frantisk Bauer, Scottish physician] the examiner can not feel the movement of the head of the mandibular condyle while the patient opens and closes, while the examiner's little finger is inserted into the auditory meatus. This is a sign of jaw dislocation. (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Muscular Skeletal*)

Baumes' sign, [Jean Baptiste Timothee Baumes, French physician, 1777-1828] retrosternal pain indicating angina pectoris. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Baumgarten's Blue sign, [P. Von Baumgarten, German pathologist, 1848—] a methylene blue test that turns blue indicating tuberculosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Baumgarten's Red sign, [P. Von Baumgarten, German pathologist, 1848—] a methylene blue test that turns red indicating leprosy. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Bayard's sign, [Henri Louis Bayard, French physician, 1812-1852] hemorrhages in infants that have been suffocated in utero, found in the subpleural and subpericardial regions. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Death*) (*Renal Reproductive*)

Bayle's sign, [Antoine Laurent Jesse Bayle, French physician, 1799-1858, also attributed to Gaspard Laurent Bayle, French physician, 1774-1816] progressive general paralysis of the insane. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Bazin's sign, [Antoine Pierre Ernest Bazin, French dermatologist, 1807-1878] buccal psoriasis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

BC goat sign, gastroenteritis in persons living in close proximity to sheep, goats, and swine. Infection is due to the zoonotic protozoal *Balantidium coli*. (*ARPS* 1990) (*Infectious disease Immunology*)

Beard's sign, [George Miller Beard, American psychiatrist, 1839-1883] neurasthenia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Bearded Woman sign, the occurrence of type 2 insulin resistant diabetes and androgen excess in postmenopausal woman. Cause is unknown. Also called Diabetic Bearded Woman Syndrome or Achard Thiers Syndrome. (*ARPS* 1990) (*Endocrine*) (*Dermatologic*)

Beau's sign, [Joseph Honoré Simon Beau, French physician, 1806-1865] transverse ridges found in the nail during periods of illness. Seen in infectious fevers, typhoid, and smallpox. Also called Beau's lines. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Beau's Cardiac sign, [Joseph Honoré Simon Beau, French physician, 1806-1865] cardiac asystole. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Beaume's sign, sternalgia also known as retrosternal pain. A sign of angina pectoris. See Baumes' sign. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Cardiovascular*)

Beauvais' sign, articular rheumatism. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Beaver Fever sign, enteritis caused by a zoonotic protozoal *Giardia lambia* infection. Beavers, dogs, and porcupines are disease hosts. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*)

Beccaria's sign, a painful sense of pulsation in the occiput region during pregnancy. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Muscular Skeletal*) (*Cardiovascular*)

Bechterew's Disease sign, [Vladimir Mikhailovich von Bekhterev, Russian neurologist, 1857-1927] spondylitis deformans. Also called Bekhterev's disease. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Becker's sign, [Otto Heinrich Enoch Becker, German ophthalmologist, 1828-1890] an increase of pulsation observed in the retinal arteries. A sign of Graves' or Basedow's disease. Also known as Becker's phenomenon. (Becker 1876) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Cardiovascular*)

Beclard's sign, [Pierre Augustin Beclard, French anatomist, 1785-1825] the appearance of central ossification within the lower epiphysis of the femur. A sign of maturity of the fetus. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Muscular Skeletal*)

Bednar's sign, [Alois Bednar, Viennese physician] yellow ulcerated apthae on the palatal raphe of the newborn. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*)

Beetles in the Gums sign, the feeling like there is a foreign body in the gingival tissue, cheek, tongue, or lips. After weeks of discomfort the subject will pull worms out of the area, which are the zoonotic *Gongylonema pulchrum* nematodes. Caused by the ingestion of infected beetles or roaches. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Nutritional*)

Beeturia sign, [Alexander Ernest Roche, British surgeon] urine that has a purplish hue, like cherry brandy. A sign of beetroot ingestion. (*ARPS* 1990) (*Renal Reproductive*) (*Nutritional*)

Beevor's sign, [Charles Edward Beevor, British neurologist, 1854-1908] 1. the patient's inability to inhibit the antagonistic muscles. A sign of functional paralysis. 2. the upward excursion of the umbilicus. A sign of paralysis of the lower parts of the recti abdominus muscles. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Begbie's sign, [James Begbie, Scottish physician, 1798-1869, Etienne Jules Bergeron, French physician, 1817-1900] 1. Graves's disease. 2. Bergeron's chorea disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Neurologic*)

Béhier-Hardy's sign, [Louis Jules Béhier, French physician, 1813-1876, Louis Phillipe Alfred Hardy, French physician, 1811-1893] the loss of the voice as a sign of the early stages of pulmonary gangrene. Also known as Béhier-Hardy aphonia and Béhier-Hardy symptom. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*) (*Otolaryngology*)

Beigel's sign, [Hermann Beigel, German physician, 1830-1879] hysteric chorea. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Beigel's Hair sign, [Hermann Beigel, German physician, 1830-1879] chignon fungus mixed upon natural hair. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Beisman's sign, an abnormal sound or murmur heard in auscultation over the closed eye. A sign of thyrotoxicosis. Also known as Beisman's bruit. (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Ophthalmic*) (*Cardiovascular*) (*Otolaryngology*)

Bekhterev's sign, [Valdimir Mikhailovich von Bekhterev, Russian neurologist, 1857-1927, Kurt Mendel, German neurologist, 1874-1946] 1. the patient experiences anesthesia of the popliteal space. A sign of tabes dorsalis. 2. Bekhterev's reflexes: deep, hypogastric, pupil, and nasal. Also known as Mendel's sign. (Bekhterev 1904) (Mendel 1904) (*TAIMD* 1909 as Bechterew's sign) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Bell's sign, [Sir Charles Bell, Scottish physiologist, 1774-1842] when attempting to close the eye on the side of the face affected in paralysis, the eyeball rolls outward and upward. Also known as Bordier-Fränkel's sign. A sign of Bell's palsy or peripheral facial paralysis. Also known as Bell's phenomenon. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Bell's Disease sign, [Sir Charles Bell, Scottish physiologist, 1774-1842] acute periencephalitis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Belladonna sign, severe dry mouth, loss of voice, dilatation of the pupils, suppression of urine, sight and hearing hallucinations. A sign of atropine poisoning. Also known as Atropine and Nightshade sign. (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Renal Reproductive*) (*Otolaryngology*) (*Ophthalmic*) (*Oral Maxillofacial*)

Belyando Spew sign, a form of grass sickness in Queensland, Australia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Benedikt's sign, [Moritz Benedikt, Viennese physician, 1835—] hemiplegia with oculomotor paralysis on the opposite side. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Bennett's sign, [John Hughes Bennett, English physician, 1812-1876] leukemia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*) (*Hematologic*)

Benzene sign, vomited matter has the odor of coal gas. An indication of poisoning with benzene or benzol. Also known as Coal Gas sign. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Berger's sign, [Emile Berger, Austrian ophthalmologist, 1855-1926] the presence of an amygdaliform, elliptical or an irregularly shaped pupil. A sign seen in the early stages of tabes dorsalis, different forms of paralysis, as well as paralytic dementia. Also known as Berger's symptom. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Infectious disease Immunology*)

Bergeron's sign, [Etienne Jules Bergeron, French physician, 1817-1900] hysteric chorea. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Bergmann's sign, [Gustov von Bergmann, German internist, 1878-1955, Louis Virgil Hammam, American internist, 1877-1946, René-Théophile-Hyacinthe Laënnec, French physician, 1781-1826] a loud crunching, rasping sound synchronous with the heartbeat. A sign heard in mediastinal emphysema and pneumopericardium. Also known as Hamman's sign. (Laënnec 1831) (Bergmann 1930) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Beriberi sign, [Edward Bright Vedder, 1878-1952] slight pressure on muscles of calf causes pain; ascertain the presence of anesthesia with a pin over anterior surface of leg; note any changes in patellar reflexes; when patient squats upon heels, note the inability to rise without use of hands. Also known as Vedder's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Muscular Skeletal*)

Berlin's sign, [Rudolf Berlin, German ophthalmologist, 1833-1897] traumatic edema of the retina. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Bernard-Sergent sign, nausea, vomiting, and diarrhea with Addison's disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Endocrine*)

Bernhardt's sign, [Martin Bernhardt, Berlin neurologist, 1844-1915] painful and disturbing sensations on the outer and anterior surfaces of the thigh. A sign of displacement of the external cutaneous nerve. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Berry-Dedrick sign, the transformation of fibroma viruses into myxoma viruses. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Besnier's sign, [Jules Besnier, French physician] chronic synovitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Bespaloff's sign, the presence of nasopharyngeal catarrh with a red tympanic membrane. An early sign of measles. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*)

Bethea's sign, [Oscar Walter Bethea, American physician, 1878-1963] when the examiner, standing back of the patient, places his fingers so that the tips rest on the upper surfaces of corresponding ribs high up in the patient's axillae, unilateral impairment

of chest expansion is indicated by the lessened degree of respiratory movement of the ribs on the side affected. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Beurmann's sign, [Lucien de Beurmann, French physician] gummatous sporotrichosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Bezold's sign, [Friedrich Bezold, Munich otologist, 1842-1908] the inflammatory swelling occurring below the apex of the mastoid process. A sign of mastoiditis. Also known as Bezold's symptom. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Otolaryngology*)

Biceps sign, contraction of the biceps muscle of the arm when its tendon is tapped. This reflex is normal, but when greatly increased it indicates the same disease as increased knee-jerk. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Biederman's sign, [Joseph Bear Biederman, American physician, 1907—] a dark red color (instead of the normal pink) of the anterior pillars of the throat, seen in some syphilitic patients. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Oral Maxillofacial*)

Bieg's Entotic sign, [Albert Bing, German otologist, 1844-1922] when sounds are heard by the patient only when spoken through an ear trumpet joined by a catheter to the eustachian tube, disease of the malleus or incus is indicated. Also known as Bing's Entotic test. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Biermer's sign, [Anton Biermer, German physician, 1827-1892, Carl Adolf Christian Jacob Gerhardt, German physician, 1833-1902] 1. the absence of laryngeal movement in dyspnea. A sign of aneurysm of the aorta. 2. the change of percussion sound on the change in the position of the patient. A sign of pneumothorax and known as a sign of pulmonary tuberculosis. Also known as the Change of Sound sign and Gerhardt's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Cardiovascular*) (*Respiratory*) (*Infectious disease Immunology*)

Biernacki's sign, [Edmund Adolfovich Biernacki, Polish pathologist, 1866-1912] the absence of the sensibility to pain in the ulna nerve. A sign of paretic (paralytic) dementia, as well as, tabes dorsalis. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Bilirubin sign, dark greenish-blue deciduous teeth. A sign of jaundice shortly after birth as a result of erythroblastosis fetalis. (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*)

Billard's sign, blue discoloration of the skin, covering the face, neck, and upper part of the chest. A sign of toxic exposure to indigo. (Billard) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Poisoning*)

Billroth's sign, [Christian Albert Theodor Billroth, Austrian surgeon, 1829-1894] 1. spurious meningocele. 2. malignant lymphoma. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Oncology*)

Binda's sign, a sudden movement of the shoulder when the head is passively and sharply turned toward the other side, an early sign of tuberculous meningitis. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Bing's sign, [Paul Robert Bing, German neurologist, 1878-1956] a pathological reflex in spastic symptom complexes. The extension of the great toe following pricking of the dorsum of the foot or toe with a pin. A sign seen in pyramidal tract lesions. Also known as Bing's reflex. (Bing 1918) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Biot's sign, [Camille Biot, French physician, 19th century] respiration characterized by irregular periods of apnea alternating with periods of four to five breaths of identical depth. A sign seen in patients with increased intracranial pressure. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Bipp's Line sign, [Rutherford Morison] a line on the gums nearly identical to the lead line, but is caused by bismuth. A sign of treatment for venereal disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Poisoning*)

Bird's sign, [Samuel Dougan Bird, Australian physician, 1832-1904] defined area of dulness and absence of respiratory sounds. A sign of hydatid cysts in the lungs or liver, caused by tapeworms. Also known as Dougan-Bird's sign and Duncan-Bird's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Gastrointestinal*) (*Infectious disease Immunology*)

Bisferiens Pulse sign, doubled peaked pulse in severe chronic aortic insufficiency. (*ARPS* 1990) (*Cardiovascular*)

Bison Abortion sign, fever and sepsis. A zoonotic disease found in bison, cattle, caribou, and elk. Also called Brucellosis disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Bittorf's sign, [Alexander Bittorf, German physician, 1876-1949] in cases of chronic septic endocarditis, blood taken from the lobule of the ear, after massage of the part, contains an increased number of leukocytes and atypical endothelial cells. These latter

are polymorphic, possess elongations and often contain in their protroplasm leukocytes, thrombocytes, and erythrocytes. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Bjerrum's sign, [Jannik Petersen Bjerrum, Danish Ophthalmologist, 1851-1920] an advanced Siedel's scotoma, with the sickel-shaped defect contiguous to the blind spot and extensions. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Black Creek sign, fever, pulmonary failure, and thrombocytopenia which progresses to death in 50 percent of victims. Caused by the zoonotic Black Creek Canal virus. The disease process is also called the hantaviral pulmonary syndrome. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Respiratory*) (*Death*)

Black Hairy Tongue sign, there is elongation of the filiform papillae on the surface of the tongue, often brown or black in colour due to accumulation of debris. Also known as *lingua nigra*. (*ARPS* 1990) (*Oral Maxillofacial*)

Black Leg sign, symptomatic anthrax, also called Quarter Evil sign. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Black Magic sign, vomited matter blackens on exposure to light. An indication of poisoning with silver nitrate or silver salts. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Black Menstruation sign, black menstruation caused by excess iron administered for a menstrual disorder. (*AACM* 1896) (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*)

Black Tongue sign, the tongue and fauces are black suffused with blood. An early sign of the Black Death, indicates infection with the zoonotic Bubonic plaque bacterium *Yersinia pestis*. (Hecker) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*) (*Death*)

Black Urine sign, urine color presents as raven black. A sign of haemolysis and haemogloinuria associated with Blackwater fever, indicating heavy malarial parasitization by *Plasmodium falciparum* and occasionally *Plasmodium vivax.* (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*) (*Infectious disease Immunology*)

Black Vomit sign, mouth feels swollen, bloodshot eyes, bradycardia, black vomit and kidney pain. A sign indicating yellow fever. Caused by the zoonotic mosquito-borne yellow fever virus. Baboons and monkeys are known hosts. Mortality can be as high as 50 percent. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Renal Reproductive*) (*Oral Maxillofacial*) (*Ophthalmic*) (*Death*)

Bladder Reflex sign, any of the reflexes of the bladder necessary for effortless evacuation of urine and subconscious maintenance of continence: vesical contraction following distention of the bladder, vesical contraction evoked by urethral flow, vesical contraction evoked by proximal urethral distention, relaxation of the urethra resulting from running liquid in the urethra, distention of the bladder resulting in relaxation of the external sphincter, relaxation of the proximal urethral smooth muscle by distention of the bladder, and vesical contraction related to running liquid through the urethra. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Blanching sign, Schultz-Charlton reaction. (*IMD* 1974) (*ARPS* 1990)

Blatin's sign, hydatid thrill. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Bleeder's sign, hemophilia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Genetic*) (*Hematologic*)

Bleeding Heart sign, [Africa] bradycardia with hemorrhagic rash. Caused by a mosquito-borne zoonotic phlebovirus. Also known as Rift Valley fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Cardiovascular*) (*Dermatologic*) (*Hematologic*)

Blind Man sign, when the patient attempts to close the eyes and smile, one eye will not shut and the eyeball rolls upward giving the blind man appearance. This is a sign of damage to the seventh cranial nerve. (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Blink sign, the corneal reflex, as indicated by irritation of the cornea results in reflex closure of the lids. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Blocq's sign, [Paul Oscar Blocq, French physician, 1860-1896] astasia abasia gait associated with neurological diseases. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Blood-influx Phenomenon sign, entrance into conjunctival or subconjunctival vessels of clear fluid (aqueous humor), deriving from an aqueous vein during compression of its recipient vessel. Formerly called *glass-rod phenomenon,* because of resemblance of the aqueous-filled vessel to a glass rod. The minute pressure differences between blood and aqueous humor, differ in glaucomatous eyes and those with normal intraocular pressure. Also called Aqueous-influx Phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*)

Bloody Tear sign, blood-stained tears, a sign of thrombosis of the cavernous sinus. Also called Jesus's weeping phenomenon. (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*) (*Otolaryngology*) (*Cardiovascular*)

Blue sign, cyanosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Cardiovascular*) (*Poisoning*) (*Respiratory*)

Blue Baby sign, [Niels Stensen, Danish scientist, 1638-1686, Étienne-Louis Arthur Fallot, French physician, 1850-1911] tetralogy of Fallot, or other known cyanotic heart defects. (*ARPS* 1990) (*Cardiovascular*)

Blue Diaper sign, infants with bluish urine-stained diapers. An indication of the inability to breakdown tryptophan. Also known as Drummond's syndrome. (*ARPS* 1990) (*Nutritional*) (*Renal Reproductive*) (*Gastrointestinal*) (*Genetic*)

Blue Hair sign, blue hair as seen in workers in cobalt and indigo mines. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Poisoning*)

Blue Pink Striae sign, [Harvey Williams Cushing, American surgeon, 1869-1939] striae on the abdomen and upper thighs which are blue-pink in colour. A sign of Cushing's syndrome. (*ARPS* 1990) (*Dermatologic*) (*Endocrine*)

Blue Scrotum sign, [John Henry Bryant, English physician, 1867-1906] hemorrhage into the retroperitoneum causing discoloration of the scrotal epithelium. A sign in ruptured aortic aneurysm. Also known as Bryant's Blue sign. (Ratzan et al 1975) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

Blumberg's sign, [Jacob Moritz Blumberg, German surgeon, 1873-1955] the occurrence of a sharp pain when the examiner presses over McBurney's point then releases suddenly. A sign found in early peritoneal inflammation and appendicitis. (Blumberg 1918) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Blyth's sign, [Alexander Wynter Blyth, English health official] the presence of lead in water. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Poisoning*)

Boas's sign, [Ismar Isidor Boas, German physician, 1858 1938] the presence of lactic acid in the gastric juice. A sign of certain cancers of the stomach. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Oncology*)

Bock's sign, married women of the Dyaks are tattooed on the hands and feet, a sign of ceremonial marking. (Bock) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Bockhart's sign, [Max Bockhart, German physician] impetigo of the hair follicles. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Boeck's sign, [Carl Wilhelm Boeck, Norwegian physician, 1808-1875] scabies caused by the wolf mite. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Bolognini's sign, a sensation of friction observed on alternate pressure with the fingers of both hands on the right and left sides of the belly. An early sign of measles. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Bone Vomit sign, remnants of a fetus in vomit, from miscarriage of extrauterine pregnancies or dermoid cysts. Also called abortion by the mouth. (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*)

Bonfils' sign, [Emile Adolphe Bonfils, French physician] Hodgkin's disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*)

Bonhoeffer's sign, [Karl Bonhoeffer, German psychiatrist, 1868—] decreased muscle tone in chorea. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Bonnet's sign, [Amedee Bonnet, French surgeon, 1809-1858] pain on thigh adduction in sciatica. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Boohoo sign, fever and malaise when visiting the Hawaiian Islands. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Bordet's sign, [Jules Jean Baptiste Vincent Bordet, Nobel laureate, Belgian bacteriologist, 1870-1961] Bordet's phenomenon or serum test. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Bordet-Gengou sign, [Jules Jean Baptiste Vincent Bordet, Nobel laureate, Belgian bacteriologist, 1870-1961, Octave Gengou, French bacteriologist, 1875-1957] fixation of the complement phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Bordier-Fränkel's sign, when attempting to close the eye it rolls outward and upward. A sign of peripheral facial paralysis. Also known as Bell's sign (palsy) or phenomenon [Sir Charles Bell, Scottish physiologist in London, 1774 1842]. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Borellus's sign, chromidrosis, perspiration with a deep green color. (Borellus 1676) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Borrowing-lending Hemodynamic sign, the phenomenon of the shifting of blood from one part of the body to another, as from the skin to the internal organs, according to physiologic need; hematometakinesis phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Borsieri's sign, [Giovanni Battista Borsieri de Kanifeld, French physician, 1725-1785] when the fingernail is drawn along the skin in early stages of scarlet fever, a white line is left which quickly turns red. Also known as Borsieri's line. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Boston's sign, [Leonard Napoleon Boston, American physician, 1871-1931] in Graves' disease, when the eyeball is turned downward there is arrest of descent of the lid, spasm, and continued descent. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Botocudos sign, a sign of cosmetic disfigument among Brazilian tribes in which wooden *peleles* are inserted in their lower lips and ears. (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*)

Bouchard's sign, [Charles Jacques Bouchard, French physician, 1837-1915] a few drops of Fehling's solution are added to the urine and the mixture is shaken; if pus from the kidney is present, fine bubbles will form which push to the surface the coagulum formed by heating. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

Bouchard's Disease sign, [Charles Jacques Bouchard, French physician, 1837-1915] dilatation of the stomach from inefficiency of the gastric muscles. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bouchard's Node sign, [Charles Jacques Bouchard, French physician, 1837-1915] firm, non painful nodules on the dorsolateral aspects of the proximal interphalangeal joints as seen with osteoarthritis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Bouillaud's sign, [Jean Baptiste Bouillaud, French physician, 1796-1881] permanent retraction of the chest in the precordial region; a sign of adherent pericardium. (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Bouillaud's Cardiac sign, [Jean Baptiste Bouillaud, French physician, 1796-1881] endocarditis. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Boutillau's sign, a peculiar tinkling sound heard over the right side of the apex beat. A sign found in hypertrophy of the heart. (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*)

Bouveret's sign, [L. Bouveret, French physician] a distention of the cecum and right iliac fossa. A sign found in obstruction of the large intestine. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Bouveret's Heart sign, [L. Bouveret, French physician] paroxysmal tachycardia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Bowditch's sign, tinea imbricata found in the Bowditch, Union Islands. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Bowen's sign, [John T. Bowen, American dermatologist, 1857—] pink papular precancerous dermatosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Bowler Hat sign, a bowler hat shaped shadow representing the filling defect from a colon polyp or the diverticulum on abdominal radiography. Known also as the Mexican Hat sign. (*ARPS* 1990) (*Gastrointestinal*)

Boyce's sign, a gurgling sound heard on pressure by the hand on the side of the neck, in diverticulum of the esophagus. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Gastrointestinal*)

Bozzolo's sign, [Camillo Bozzolo, Italian physician, 1845 1920] a visible pulsation of the arteries within the nasal mucus membrane. A sign indicating aneurysm of the thoracic aorta. (Bozzolo) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Cardiovascular*)

Bracken sign, severe intoxication often leading to death, due to enzymatic destruction of thiamine caused by the ingestion of the bracken fern *Pteridium aquilinum.* Also called Fiddler's Death. (*ARPS* 1990) (*Nutritional*) (*Poisoning*) (*Death*)

Bragard's sign, with the knee stiff, the lower extremity is flexed at the hip until the patient experiences pain; the foot is then dorsiflexed. Increase of pain points to disease of the nerve root. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Braid's sign, [James Braid, English physician, 1795-1860] state of hypnosis. Also called Braidism. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Brain's Reflex sign, an extension of the hemiplegic flexed arm when the patient assumes the quadrupedal position; called also quadrupedal extensor reflex. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Brain-fag sign, brain tiredness, mental exhaustion. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Brake sign, the tendency of a muscle to maintain itself in its normal resting position; called also Rieger's phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Branham's sign, [Henry H. Branham, American surgeon, James Adolf Israel, German surgeon, 1848-1926, Carl Nicoladoni, Austrian surgeon, 1847-1902] compression of an artery proximal to an arteriovenous fistula causes bradycardia. Also known as Israel's sign and Nicoladoni's sign. (Nicoladoni 1875) (Israel 1877) (Branham 1890) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Brauch-Romberg sign, [Brauch, German neurologist, Moritz Heinrich Romberg, German neurologist, 1795-1873] swaying of the body when the subject is standing with the feet close together and the eyes closed. A sign of ataxia. Also known as Brach's sign and Rhomberg's sign. (*TAIMD* 1909 as Brach-Romberg's sign) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Braun-Fernwald's sign, [Carl V. Braun, Austrian obstetrician, 1832-1891] a sign of early pregnancy with an asymmetrical enlargement of the uterus. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Braunwald's sign, the occurrence of a weak pulse instead of a strong one immediately after a premature ventricular contraction. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Braxton Hicks' sign, [John Braxton Hicks, English gynecologist, 1823-1897] the intermittent contraction of the uterus after the third month of pregnancy. Also known as Hicks' sign. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Bread-Crumbling sign, paralysis agitans. (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Breakbone sign, a week of fever with rash, headache, and joint pain associated with a mosquito bite. An indication of Dengue fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Break-off sign, a state of disconnectedness or unreality experienced by high-altitude pilots. Its symptomatic sensations are apparently indescribable in understandable

physical terms, but the condition could be the result of a loss of all the physical sense perceptions. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Breast Pang sign, angina pectoris. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Bregmocardiac Reflex sign, pressure upon the bregmatic fontanel slows the action of the heart. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Breisky's sign, [August Breisky, German gynecologist, 1832-1889] kraurosis vulvae. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Brick Layer's sign, neurosis involving muscles of the hand. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Brick Maker's sign, uncinariasis. Also called Miner's disease and Tunneler's hookworm. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Brickner's sign, [Richard Max Brickner, American neurologist, 1896—] diminished oculoauricular associated movements seen in impairment of function of the facial nerve. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Otolaryngology*)

Bright's sign, [Richard Bright, English physician, 1789-1858] any one of a group of kidney-diseases attended with albuminuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Brill's sign, [Nathan E. Brill, American physician, 1860—] a possible form of mild typhus fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Brinton's sign, [William Brinton, English physician, 1823-1867] linitis plastica. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Oncology*)

Briquet's sign, [Paul Briquet, French physician, 1796-1881] hysterical paralysis of the diaphragm. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*) (*Neurologic*)

Brissaud's Reflex sign, [Edouard Brissaud, French physician, 1852-1909] contraction of the tensor muscle of fascia lata on tickling the sole. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Dermatologic*)

Brissaud-Marie sign, [Edouard Brissaud, French physician, 1852-1909, Pierre Marie, French neurologist, 1853-1940] unilateral glossolabial spasm. A sign of hysteric

hemispasm. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Broadbent's sign, [Sir William Henry Broadbent, London physician, 1835-1907] a thoracic wall retraction seen on the left side of the back, intercostally near the eleventh and twelfth ribs. A sign of pericardial adhesion. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Broadbent's Inverted sign, [Sir William Henry Broadbent, London physician, 1835-1907] pulsations synchronizing with ventricular systole on the posterior lateral wall of the chest in gross dilatation of the left atrium. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Brock's sign, [Russell Claude Brock, British surgeon] displacement of the apex beat, as a distinguishing sign between lung collapse and pneumonia. (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Brockenborough's sign, occurrence of a weak pulse instead of a strong one immediately after a premature ventricular contraction. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Brocq's sign, [Anne Jean Louis Brocq, French dermatologist, 1856—] parakeratosis psoriasiformis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Brodie's sign, [Sir Benjamin Collins Brodie, English surgeon, 1783-1862] a black spot on the glans penis. A sign of urinary extravasation into the spongiosum. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Brodie's Knee sign, [Sir Benjamin Collins Brodie, English surgeon, 1783-1862] chronic synovitis, especially of the knee, with a pulpy degeneration of the parts affected. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Broken Heart sign, stress cardiomyopathy. (*ARPS* 1990) (*Cardiovascular*)

Broken Straw sign, with embryonal rhabdomyosarcoma, the spindle cell is sharply bent and looks like a broken straw. (*ARPS* 1990) (*Oncology*)

Bronchiseptica sign, pertussis and pneumonia. A zoonotic Bordetella disease from the saliva of rabbits, guinea pigs, and dogs. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Brown's sign, [Sir James Crichton-Browne, Scottish physician, 1840-1938] tremor of the outer angles of the eyes and of the labial commissures. A sign seen in the earlier

stages of paretic dementia. Also known as Crichton-Browne's sign. (*TAIMD* 1909) (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*) (*Neurologic*)

Brown-Séquard's sign, [Charles Edouard Brown-Séquard, French neurologist, 1817-1894] 1. contralateral loss of pain and temperature sensation and hemiparaplegia with remaining muscular sensation. A sign of unilateral damage of the spinal cord. Also known as Brown-Séquard's paralysis syndrome or compression sign. 2. a reflex type flaccid paralysis. A sign of urinary tract disorder. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Renal Reproductive*)

Brown Tongue sign, a dry, brown tongue seen with intestinal obstruction, a seriously grave omen. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*)

Bruce's sign, [David Bruce, British surgeon] Malta fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Bruck's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] astrophobia, the morbid fear of being struck by lightning. Also called astropaphobia. (Bruck) (Beard) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Bruck's Bone sign, [Alfred Bruck, German physician, 1865—] a condition marked by deformity of bones, multiple fractures, ankylosis of joints, and atrophy of muscles. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Brudziński's sign, [Jósef Brudziński, Polish paediatrician, 1871-1917] flexion of the neck causes flexion in the knees and hips. A sign of meningitis, as well as, subarachnoidal haemorrhages and sometimes encephalitis. Also known as Brudziński's Neck sign. (Brudziński 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Brudziński's Cheek sign, [Jósef Brudziński, Polish paediatrician, 1871-1917] pressure on the cheek below the zygomatic elicits a reflex rising of the lower arm. A sign of meningitis. Also known as Brudziński's phenomenon. (Brudziński 1916) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Oral Maxillofacial*)

Brudziński's Contralateral sign, [Jósef Brudziński, Polish paediatrician, 1871-1917] flexion of one knee into the abdomen causes similar flexion of the other knee. A sign of meningitis. Also called Brudziński's reflex and Contralateral sign. (Brudziński 1908) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Brudziński's Symphyseal sign, [Jósef Brudziński, Polish paediatrician, 1871-1917] pressure on the symphysis elicits a reflexive hip and knee flexion and abduction of the

leg. A sign of meningitis. (Brudziñski 1916) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Brug's sign, [Lichtenstein and Brug, parasite researchers, c. 1927] Malayan filariasis, a zoonotic skin and lymphatic disease caused by nematodes transferred by the bite of an infected mosquito. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Bruhl's sign, anemia of the spleen accompanied by fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Infectious disease Immunology*)

Brun's sign, [Ludwig Bruns, Hanover neurologist, 1858-1916] visual disturbances on sudden movement of the head, with intermittent headache, vertigo, and vomiting. A sign characteristic of cysticercus infection or lesion of the fourth ventricle, or tumors of the midline of the cerebellum and third or lateral ventricles. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Oncology*)

Brunati's sign, the appearance of opacities in the cornea during the course of pneumonia or typhoid fever. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Brussels' sign, anomalous skin disease which approximates clinically and histologically, granulomata and sarcomata. Also known as mycosis fungoides. (Thomson 1893) (Jamieson) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Bryant's sign, [Sir Thomas Bryant, British surgeon, 1828-1914] an abnormal position of the shoulder with lowering of the axillary folds. A sign in dislocation of the shoulder. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Bryant's Blue sign, [John Henry Bryant, English physician, 1867-1906] hemorrhage into the retroperitoneum causing discoloration of the scrotal epithelium. A sign in ruptured aortic aneurysm. Also known as Blue Scrotum sign. (Ratzan et al 1975) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

Bryson's sign, [Alexander Bryson, English physician, 1802-1860] diminished power of expansion of the thorax. A sign of exophthalmic goiter. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Otolaryngology*) (*Ophthalmic*) (*Respiratory*)

Buboe sign, rapid blue black swelling in the groin, neck or armpits, often oozing pus and blood. An indication of infection with the Bubonic plague. (*ARPS* 1990) (*Infectious disease Immunology*)

Buerger's sign, [Leo Buerger, American pathologist, 1879—] *thromboangiitis obliterans*. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Buhl's sign, [Ludwig von Buhl, German pathologist, 1816-1880] *icterus neonatorum*. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Bulbocavernous sign, a tap on the dorsum of the penis retracts the bulbocavernous portion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Bulbomimic sign, in coma from apoplexy, pressure on the eyeball causes contraction of the facial muscles on the side opposite to the lesion; in coma from toxic causes the reflex occurs on both sides. Called also Facial and Mondonesi's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Poisoning*)

Bulimia sign, intrinsic dental erosion, most often on the lingual surfaces the teeth from exposure to gastric acids. Diseases linked with this finding are anorexia nervosa, bulimia, and gastroesophageal reflex. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Neurologic*)

Bull's Eye sign, a zoonotic disease from deer and rodents. Also known in forms as borreliosis and Lyme disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Bull's Teeth sign, taurodontism. (*ARPS* 1990) (*Oral Maxillofacial*)

Bulldog Head sign, achondroplasia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Bullock's sign, red-brown liver crust on a scorbutic ulcer. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Bunya Fever sign, fever, seizures, and paralysis. These neurologic signs are due to the California group zoonotic viral infections called the *Bunyavirus* species. This type of arbovirus can be spread by ticks and mosquitoes. This family of viruses includes the one that causes Crimean-Congo hemorrhagic fever with high mortality rates. These viruses may be used as biological weapons. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Burger's sign, [Jean Garel, French physician] on electric trans-illumination of the oral cavity, there is an absence of light-perception presenting as an infraorbital shadow on the affected side of the antrum of Highmore. A sign of diseases of the antrum of Highmore,

including empyema and tumor. Also known as Garel's sign and Heryng's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Oncology*)

Burghart's sign, [Hans Gerny Burghart, German physician, 1862-1932] fine crepitant rales heard over the anterior base of the lung. An early sign of incipient pulmonary *Mycobacteruim tuberculosis*. Also known as Burghart's symptom. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Burns' sign, [Allan Burns, Scottish surgeon, 1781-1813] dermoid cyst found in Burn's space. (*ARPS* 1990) (*Dermatologic*)

Burton's sign, [Henry Burton, English physician] a blue line occurring at the gingival border with teeth. A sign of chronic lead poisoning. Also known as Burton's line. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Bush sign, [New Zealand] a form of enzootic marasmus due to a cobalt deficiency. (*ARPS* 1990) (*Nutritional*) (*Death*)

Busquet's sign, [Busquet, French physician] osteoperiostitis of the foot. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Butter's sign, colon cancer near the liver flexure. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*) (*Gastrointestinal*)

Butterfly sign, the butterfly rash of systemic lupus erythematous. (*ARPS* 1990) (*Dermatologic*)

Button Maker's sign, chorea of the hands and arms. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Bychowski's sign, [Amans Gaussel, French physician, 1871-1937, Joseph Grasset, French physician, 1849-1918, Charles Franklin Hoover, American physician, 1865-1927] when the patient in a recumbent position attempts to lift the paretic limb, there is greater downward pressure on the examiner's hand with the sound limb than is observed in the test with a normal person, also described as, in the normal state or in genuine paralysis, if the patient, lying on a couch, is directed to press the leg against the couch, there will be a lifting movement seen in the other leg; this phenomenon is absent in hysteria and malingering. Also known as Complimentary Opposition sign, Grasset's sign, Gaussel's sign, and Hoover's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Cagot sign, a deformed ear with no lobe found in people of the Pyrenees. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*) (*Genetic*)

Caisson-disease sign, diver's paralysis; tunnel disease; a condition frequently seen in those who have worked under high atmospheric pressure, as in caissons, diving-bells, etc., after they have returned to the ordinary atmosphere. The disease is attended with various paralytic and apoplectic symptoms-pain in the back, paraplegia, incoordination, incontinence of urine, etc. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Respiratory*) (*Neurologic*) (*Poisoning*)

Calvé-Perthes' sign, [Jacques Calvé, French surgeon, Georg Clemens Perthes, German surgeon, 1869—] Legg's disease of the hip-joint. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Camel sign, fever, sepsis, and arthritis from contact with milk or cheese. A zoonotic *Brucella* disease found in camels, sheep, and goats. (*ARPS* 1990) (*Infectious disease Immunology*)

Camp-Fever sign, typhus fever. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Candiru sign, uncomfortable feeling in urethra while urinating in water, followed with burning pain, urinary retention, and bladder pain. Indicates the likely presence of an Amazonian *candiru* fish trapped in the urethra or bladder. This is a carnivorous fish that is able to swim up the urethra of a person while urinating in the water. It has a ravenous appetite and will continue to eat you alive. (*ARPS* 1990) (*Renal Reproductive*)

Cantelli's sign, dissociation between the movements of the head and eyes: as the head is raised the eyes are lowered, and vice versa. Also known as Doll's Eye sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Capp's sign, Capp's reflex. (*IMD* 1974) (*Neurologic*) (*Muscular Skeletal*)

Caput Medusae sign, radiating veins from the umbilicus. A sign of portal venous obstruction. Also known as Medusa's sign. (*ARPS* 1990) (*Cardiovascular*)

Carabelli's sign, [Georg C. Carabelli, Vienna surgeon, 1787-1842] an extra cusp on the permanent maxillary first molar, often found lingual to the mesiolingual cusp. Also known as a fifth or supplemental cusp, as well as, Carabelli's tubercle. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Carboxyhemoglobin sign, the bright red coloration of the skin and internal organs due to carbon monoxide poisoning. (*ARPS* 1990) (*Respiratory*) (*Poisoning*) (*Dermatologic*)

Cardarelli's sign, [Antonio Cardarelli, Italian physician, 1831-1926] sideways movement or tugging of the trachea. A sign of aortic aneurysm. Also known as Castellino's sign. (Cardarelli) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*) (*Otolaryngology*)

Cardinal signs (of inflammation), known as dolor, calor, rubor, tumor, and functio laesa. (*IMD* 1974) (*ARPS* 1990)

Cardiorespiratory sign, a change in the normal pulse-respiration ratio from 4: 1 to 2: 1; seen in infantile scurvy. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*) (*Nutritional*)

Carman's sign, the radioscopic appearance of a crescentic shadow made by the crater of a gastric ulcer: when the convexity of the crescent points outward the ulcer is on the lesser curvature; when the convexity points downward the ulcer is distal to the angular incisure. Also known as Meniscus sign. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Carnett's sign, [John B. Carnett, American surgeon] the test for demonstrating parietal tenderness consists of palpation during a period in which the patient holds his anterior abdominal muscles as tense as possible. The tense abdominal muscles prevent the examiner's fingers from coming in contact with the underlying viscera and any tenderness that is elicited over them will be parietal in location. Tenderness elicited over relaxed muscles may be either parietal or intra-abdominal in origin. Tenderness present with relaxed muscles and absent with tense muscles is due to a subparietal lesion and its cause should be sought inside of the abdomen. Tenderness found both when the muscles are relaxed and when voluntarily tensed is due to an anterior parietal lesion and its cause should be sought outside the abdominal cavity. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*) (*Muscular Skeletal*) (*Neurologic*)

Carotid Sinus Sign, pressure on, or in, the carotid artery at the level of its bifurcation causing reflex slowing of the heart rate; this reflex originates in the wall of the sinus of the internal carotid artery. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Carrión's sign, [Daniel A. Carrión, Peruvian, 1850-1885] verruca peruana. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Carrot sign, caroteneaemia, the yellow pigmentation of the skin from excess carotene intake. Also associated with mangoes, pawpaw, and oranges. May indicate a defect

in the enzymatic conversion of vitamin A found in myxoedema. Also seen in hyperbetalipoproteinaemia. (*ARPS* 1990) (*Dermatologic*) (*Nutritional*)

Carter's sign, [Henry Vandyke Carter, Anglo-Indian physician, 1831-1897] Asiatic relapsing fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Carvallo's sign, there is a change of the pansystolic murmur with inspiration, indicating tricuspid regurgitation. (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Castellino's sign, sideways movement or tugging of the trachea. A sign of aortic aneurysm. Also known as Cardarelli's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*) (*Otolaryngology*)

Cat's sign, murine typhus, a zoonotic *Rickettsia* fever from cat fleas. (*ARPS* 1990) (*Infectious disease Immunology*)

Cat Eye sign, widely spaced eyes with down slanting tissue folds. A sign of a defect with chromosome number 22. Individuals may have disorders with internal organs, and the organs may be in abnormal locations. (*ARPS* 1990) (*Genetic*) (*Renal Reproductive*) (*Gastrointestinal*) (*Ophthalmic*)

Cat Scratch sign, lymphadenopathy and sepsis from the zoonotic *Bartonella* bacteria found in cats. (*ARPS* 1990) (*Infectious disease Immunology*)

Cattaneo's sign, if following strong percussion over the spinous processes of the dorsal vertebrae, reddish spots appear directly over the processes, tracheobronchial adenopathy is indicated. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Respiratory*)

Caustic sign, pain in the pit of the stomach and vomiting of slime mixed with blood and altered brown blood. A sign of poisoning with caustic alkalis. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Cautery signs, often circular burn marks over areas of long standing pain. These areas have been burned as a form of primitive medical treatment for the condition. Burns on the hands and arms can mimic melanoma. There may be burns on the abdomen, back, and extremities. On the skull these cautery burns are sometimes in the form of a cross, inflicted as a treatment for headaches and fevers in childhood. In West Africa infants and children with febrile convulsions may be treated by plunging their feet into a cooking pot of boiling oil, causing horrific burns. (*ARPS* 1990) (*Dermatologic*) (*Neurologic*)

Cayenne sign, intensely painful nasal mucous membrane, mental distress, sneezing, followed by the throat, mouth, gums, and teeth burning with acute pain. A sign of

exposure to arsenical gas. Also known as Arsenical Gas sign. (*ARPS* 1990) (*Poisoning*) (*Otolaryngology*) (*Oral Maxillofacial*) (*Neurologic*)

Cayenne Pepper Pus sign, cayenne-pepper granules within drops of pus. A sign indicating actinomycosis. (*ARPS* 1990) (*Infectious disease Immunology*)

Cegka's sign, invariability of the cardiac dullness during the different phases of respiration; a sign of adherent pericardium. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Cerebral Cortex Reflex sign, bilateral pupillary contraction when the patient sits in a darkened room and without accommodation or convergence directs his attention to a bright object already within his field of vision. Called also Haab's Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Cerebral Irritation sign, thirty to forty hours after an injury, the patient curls up in bed and faces away from the light due to photophobia. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Chabert's sign, [Philebert Chabert, French veterinarian, 1737-1814] symptomatic anthrax. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Chaddock's sign, [Charles Gilbert Chaddock, American neurologist, 1861-1936] stimulation below the external malleolus produces extension of the great toe. A sign of lesion in the pyramidal tract. Also known as Chaddock's reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Chadwick's sign, [James Read Chadwick, American gynecologist, 1844-1905] a dark blue-purple-red appearance of the cervical mucosa and vaginal mucosa with pregnancy. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Chagas-Cruz sign, [Carlos Chagas, Brazilian physician, Oswald Cruz, Brazilian physician, 1871-1917] erratic fever, hepatosplenomegaly, brain and heart involvement. Also known as South American zoonotic protozoal trypanosomiasis. Caused by exposure to fecal material from the assassin bug and other types of triatoma insects. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Chagres' sign, malarial fever in Panamanian railroad workers. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Chamaeleon sign, the assumption of a green color by a potato culture of *Bacillus pyocyaneus* at the point where touched by a platinum wire. Also known as Chamaeleon phenomenon. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Chandelier sign, during bimanual pelvic examination movement of the cervix causes extreme pain. A sign of pelvic inflammatory disease. (*ARPS* 1990) (*Renal Reproductive*)

Change of Note sign, [Nikolaus Friedreich, German physician, 1825-1882] 1. the diastolic collapse of the cervical veins. A sign of adherent pericardium. 2. lowering of the pitch of the percussion note over an area of cavitation during forced inspiration. Also known as Friedreich's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Change of Sound sign, [Anton Biermer, German physician, 1827-1892, Carl Adolf Christian Jacob Gerhardt, German physician, 1833-1902] 1. the absence of laryngeal movement in dyspnea. A sign of aneurysm of the aorta. 2. the change of percussion sound on the change in the position of the patient. A sign of pneumothorax and known as a sign of pulmonary tuberculosis. Also known as Biermer's sign and Gerhardt's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Cardiovascular*) (*Respiratory*) (*Infectious disease Immunology*)

Charcot's sign, [Jean Marie Charcot, French physician, 1825-1893] 1. the presentation of a raised eyebrow which lowers on facial contraction. A sign of peripheral facial paralysis. 2. intermittent limping. A sign of arteriosclerosis of the feet and legs. 3. rarefying osteitis of a joint associated with tabes dorsalis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Charcot-Vigouroux's sign, [Jean Marie Charcot, French physician, 1825-1893, August Vigouroux, French neurologist] diminished electric resistance of the skin for galvanic current. A sign of exophthalmic goiter. Also known as Vigouroux's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Chase's sign, [Ira Carleton Chase, American physician, c.1868] when the hand is pressed deep along the transverse colon quickly from left to right, pain is felt in the cecal region, if the other hand is deeply blocking the descending colon. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Cheek sign, in meningitis if pressure is exerted on both cheeks just under the zygomas there is reflex upward jerking of both arms with simultaneous bending of both elbows. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Cherchewsky's sign, [Mikhail Cherchevski, Russian physician] ileus of nervous origin. Also called Cherchevski's disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Cherry-red sign, the cherry-red appearance of the blood from a cyanide victim. (*ARPS* 1990) (*Hematologic*) (*Poisoning*)

Cheyne-Stokes sign, [John Cheyne, Scotch physician, 1777-1836, William Stokes, Irish physician, 1804-1878] a type of breathing characterized by rhythmic increasing and waning of the depth of respiration to a certain point, followed with recurring periods of apnea. A sign seen in coma caused by affection of the nervous centers. Also known as Cheyne-Stokes respiration. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*) (*Neurologic*)

Chicken Cholera sign, a zoonotic disease caused by the *Pasteurella* bacterium. Can cause septicaemic plague in humans. (*ARPS* 1990) (*Infectious disease Immunology*)

Chicken House Blindness sign, conjunctivitis from exposure to birds infected with the zoonotic Newcastle paramyxovirus. Does not actually cause blindness, just self-limiting conjunctivitis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Chicken Mist sign, fungal pneumonia caused by exposure to chicken or bat faeces, containing the zoonotic *Histoplasma capsulatum.* (*ARPS* 1990) (*Infectious disease Immunology*)

Chilaiditi's sign, a form of hepatoptosis. (*ARPS* 1990) (*Gastrointestinal*)

Chin Reflex sign, a stroke on the lower jaw causes a clonic movement. Also called chin-clonus or jaw-jerk. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

China Pockmark sign, [before c. 1700, China] Eastern folkways ritual smallpox inoculations made between the thumb and forefinger resulting with pockmark scar. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Chinese Cirrhosis sign, cholecystitis associated with the ingestion of undercooked fish containing the zoonotic *Clonorchis sinensis* liver fluke. Endemic in China, Korea, Taiwan, and Vietnam. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Chin-retraction sign, [J. U. Human, British physician] a sign of the third stage of anesthesia: the chin and larynx move downward during inspiration. Also known as Human's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Chipmunk sign, parotid gland swelling of bulimia nervosa. (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Chitterlings' sign, mesenteric adenitis caused by the zoonotic *Yersinia* bacterium. The disease can be harbored in puppies and kittens, but primarily pigs. Also called chitlin diarrhea and chitlin appendicitis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*)

Chloracne sign, chloracne of the face as an indication of dioxin poisoning. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Poisoning*)

Chlorine sign, severe lachrymation and patient acts exactly like they are drowning, sometimes the patient imagines they recovered from the original lachrymation and the effects are delayed. A sign of exposure to chlorine gas. (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Ophthalmic*)

Chlorosis sign, white mottling of the hair extending two inches from the head in a patient sick with chlorosis. (Richelot c.1800's) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Chocked sign, in skiascopy, absence of movement of the retinal illumination on reaching the point of reversal. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Chojnowski's sign, chromidrosis, perspiration with the color of and consistency of milk. (Chojnowski 1863) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Christensen's sign, when the mandible is protruded, a separation occurs, in the region of the molars, between the surfaces which are in contact in centric occlusion, the degree of separation depending on the downward pitch of the condyle paths. Also may be dependent on occlusal guidance of the anterior teeth. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Christian's Curse sign, confusion, partial paralysis, hydrocephalus, cerebral edema, epileptic seizures, and death. Initiated by the ingestion of undercooked pork or human faeces containing the eggs of the zoonotic *Taenia solium* pork tapeworm which develop to cause neurocysticercosis. Islam forbids the consumption of pork and as a result these infections are very rare in predominately Muslim areas. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Neurologic*)

Chrobak's sign, [Rudolph Chrobak, Austrian gynecologist, 1943-1910] a probe sinks deep in necrotic cervical tissue. A sign of carcinoma. (Chrobak 1879) (*ARPS* 1990) (*Renal Reproductive*) (*Oncology*)

Chronic sign, one which is slow in its progress and of long continuance. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Chvostek's sign, [Franz Chvostek, Austrian surgeon, 1835-1884, Nathan Weiss, Vienna physician, 1851-1883, Friedrich Schultze] a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. Also known as Chvostek-Weiss sign, Face sign, Schultze's sign, and Schultze-Chvostek sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Chvostek-Weiss sign, [Franz Chvostek, Austrian surgeon, 1835-1884, Nathan Weiss, Vienna physician, 1851-1883, Friedrich Schultze] a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. Also known as Chvostek's sign, Face sign, Schultze's sign, and Schultze-Chvostek sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Chylopoietic sign, one which affects the digestive organs. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Cider sign, severe watery diarrhea, lasting up to 4 days. Caused by a zoonotic protozoal infection with *Cryptosporidium parvum*, which is present in unpasteurized apple juice and cider. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Cigar sign, a form of chronic tobacco poisoning, caused by occupational inhalation of tobacco dust in cigar and cigarette factories. Also called tabacosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Poisoning*) (*Neurologic*)

Ciliary sign, the movement of the pupil in accommodation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Ciliospinal sign, stimulation of the skin of the neck dilates the pupil. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Dermatologic*)

Cirrhosis Back sign, excoriations of the back secondary to scratching. An early sign of primary biliary cirrhosis. (*ARPS* 1990) (*Dermatologic*) (*Gastrointestinal*)

Clapton's sign, a greenish-purple line at the junction of the teeth with the gum. A sign of chronic copper poisoning. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Clark's sign, [Alonzo Clark American physician, 1807-1887] 1. obliteration of hepatic dullness. A sign of tympanitic distention of the abdomen. 2. tympanic percussion note over the liver, indicating a perforation of the intestine. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Clarke's Tongue sign, [Sir Charles Mansfield Clarke, English physician, 1782-1857] a fissured indurated tongue due to syphilis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Clasp-knife sign, lengthening reaction. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Claude's Hyperkinesis sign, [Henri Claude, French psychiatrist, 1869-1945] reflex movements of paretic muscles elicited by painful stimuli. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Clavicular sign, a tumefaction at the inner third of the right clavicle; seen in congenital syphilis. Also known as Higoumenaki's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Clavicle Expansion sign, expansion and swelling of the clavicle in a matter of weeks. A sign of malignant disease of the bone. (*ARPS* 1990) (*Muscular Skeletal*) (*Oncology*)

Clay Stool sign, clay coloured stool due to complete obstruction to the common bile duct by carcinoma of the pancreas. (*ARPS* 1990) (*Oncology*) (*Gastrointestinal*)

Cleeman's sign, creasing of the skin just above the patella, indicative of fracture of the femur with overriding of fragments. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Clenched Fist sign, clenched fist over the chest with angina and acute myocardial infarction, sometimes called Levine's response. (*ARPS* 1990) (*Cardiovascular*)

Cloquet's Needle sign, [Jules Germain Cloquet, French surgeon, 1790-1883] a clean needle is plunged into the biceps muscle and soon oxidizes. A sign of life. Also known as Labordes' sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Death*) (*Muscular Skeletal*)

Clubbed Fingers sign, clubbing of the fingers and fingernails as a sign of chronic anoxemia, cirrhosis of the liver, and bacterial endocarditis. The ends of the fingers may have the appearance of drum sticks. Also called Hippocratic fingers. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Dermatologic*)

Coal Gas sign, vomited matter has the odor of coal gas. An indication of poisoning with benzene or benzol. Also known as Benzene sign. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Coat's sign, rupture of the bladder in intoxicated persons. (Coats 1894) (Ferraton and Rivington 1896) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*)

Coated Tongue sign, indicative of constipation or gastro-intestinal upset. Often confirms evidence of appendicitis. (*ARPS* 1990) (*Gastrointestinal*) (*Oral Maxillofacial*)

Cobb's sign, sudden fever with pigmentation of the nose and cheeks seen in India. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Cochin sign, elephantiasis of the leg. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Cochleo-orbicular sign, contraction of the orbicularis palpebrarum muscle when a sharp, sudden noise is made close to the ear; does not occur in total deafness from labyrinthine disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Cochleopalpebral sign, contraction of the orbicularis palpebrarum muscle when a sharp, sudden noise is made close to the ear; does not occur in total deafness from labyrinthine disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Cochleopapillary sign, a reaction of the iris (contraction of the pupil followed by dilatation) to a loud sound. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Cochleostapedial sign, the reflex contraction of the stapedius muscle from noises. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Codman's sign, [Ernest Armory Codman, American physician, 1869-1940] the arm can be passively abducted without pain, but when support is removed the deltoid contracts suddenly with pain. A sign in rupture of the supraspinatus tendon. (Codman 1934) (*ARPS* 1990) (*Muscular Skeletal*)

Codman's Triangle sign, [Ernest Armory Codman, American physician, 1869-1940] a triangular radiographic shadow found between normal bone and abnormal bone growth. A sign in osteosarcoma, sometimes characteristic of Codman's tumor. (Hoeber 1925) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Oncology*)

Coffee Grounds sign, vomit containing a disintegrated old blood clot appears to contain coffee grounds. Sometimes seen with the ingestion of iron containing medicine and red wines, as well as stomach carcinoma. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*) (*Oncology*) (*Nutritional*)

Cogwheel sign, the irregular jerkiness resistance occurring when a hypertonic muscle is stretched. Also called Negro's phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Coiled Spring sign, a coiled spring pattern seen in barium enemas with many disorders of the appendix, injuries, and carcinoma. (*ARPS* 1990) (*Oncology*) (*Gastrointestinal*)

Coin sign, a coin is laid against the chest and struck by another coin producing a metallic ringing sound over a cavity filled with air. As seen in pneumothorax. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Coin Carcinoma sign, a granulomatous coin shaped lesion in the lung, resembling pulmonary cancer. The lesion is caused by the zoonotic *Dirofilaria immitis* heartworm that is found commonly in dogs and cats. The parasite is transmitted by the bite of an infected mosquito. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Cole's sign, [Lewis Gregory Cole, American radiologist, 1874-1954] deformity of the duodenal contour as seen in the roentgenogram, a sign of the presence of duodenal ulcer. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Collar Bone sign, aplasia or hypoplasia of the clavicles, demonstrating excessive mobility of the shoulders. There is also failure of the exfoliation and eruption of the teeth. A sign of cleidocranial dysostosis. (*ARPS* 1990) (*Muscular Skeletal*) (*Oral Maxillofacial*)

Collar Stud sign, stemmed tuberculous abscess. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Collier's sign, lung anthracosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Colon Cutoff sign, the absence of faeces and gas in the lower right quadrant of abdominal radiography indicating appendiceal perforation and sometimes colonic spasm. (*ARPS* 1990) (*Gastrointestinal*)

Colorado Fever sign, fever, vomiting, and meningoencephalitis. Caused by a zoonotic virus transfer from the bite of the *Dermacentor andersoni* tick. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Combined Planter sign, the simultaneous disappearance of the cortical plantar reflex and the spinal plantar reflex. A sign seen in hysteria. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Comby's sign, [Jules Comby, French paediatrician, 1853—] white patches of degenerated epithelium on the buccal mucous membrane and gingival tissues. An early sign of measles. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Commemorative sign, any sign of a previous disease. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990)

Comolli's sign, a sign of scapular fracture consisting in the appearance in the scapular region, shortly after the accident, of a triangular swelling reproducing the shape of the body of the scapula. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Complete Ptosis sign, third cranial nerve palsy. A sign seen in cerebrospinal syphilis. (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*) (*Neurologic*)

Complicating sign, one which occurs in the course of some other disease as a complication. Also called Intercurrent sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Complimentary Opposition sign, [Amans Gaussel, French physician, 1871-1937, Joseph Grasset, French physician, 1849-1918, Charles Franklin Hoover, American physician, 1865-1927] when the patient in a recumbent position attempts to lift the paretic limb, there is greater downward pressure on the examiner's hand with the sound limb than is observed in the test with a normal person, also described as, in the normal state or in genuine paralysis, if the patient, lying on a couch, is directed to press the leg against the couch, there will be a lifting movement seen in the other leg; this phenomenon is absent in hysteria and malingering. Also known as Bychowski's sign, Gaussel's sign, Grasset's sign, and Hoover's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Concato's sign, [Luigi Maria Concato, Italian physician, 1825-1882] progressive malignant inflammation of serous membranes, especially of the pleura. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Conditional sign, one that does not occur naturally in the animal but that may be developed by regular association of some physiological function with an unrelated outside event, such as ringing of a bell or flashing of a light. Soon the physiological function starts whenever the outside event occurs. Also known as conditioned reflex. (Pavlov 1911) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Conium sign, double vision with complete loss of power in the legs and then the arms, blueness of lips and fingers. A sign of poisoning from the *Citrullus colocynthis* plant.

Also known as the vine of Sodom, bitter apple, and bitter cucumber. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Poisoning*)

Conjunctival Reflex sign, closure of the eyelid when the conjunctiva is touched. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Consensual sign, stimulation upon one side of the body makes a reflex on the other side. Also called Crossed reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Consensual Light sign, stimulation of one eye by light produces a reflex response in the opposite pupil. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Constitutional sign, one which involves a system of organs or the whole body. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Contralateral sign, [Jósef Brudziñski, Polish paediatrician, 1871-1917] flexion of one knee into the abdomen causes similar flexion of the other knee. A sign of meningitis. Also called Brudziñski s Contralateral sign and reflex. (Brudziñski 1908) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Convergency sign, convergence of the visual axes with fixation on a near point. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Convulsive sign, one in which several muscles contract convulsively without coordination. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Cool Side sign, unilateral anhidrosis found with lung carcinoma. Caused by destruction of the unilateral superior cervical ganglion resulting with the inability to sweat on the affected side. (*ARPS* 1990) (*Dermatologic*) (*Respiratory*) (*Oncology*)

Coopernail sign, [George Peter Coopernail, American physician, 1876—] ecchymosis on the perineum and scrotum or labia: a sign of fracture of the pelvis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Muscular Skeletal*)

Coordinated sign, one in which several muscles react so as to produce an orderly and useful movement. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Cope's sign, tenderness over the appendix on stretching the psoas muscle by extending the thigh. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Gastrointestinal*)

Corlett's sign, [William Thomas Corlett, American dermatologist, 1854—] a contagiosa bullosa form of impetigo beginning on the face. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Corneal sign, irritation of the conjunctiva closes the lids. Called also Eyelid-closure reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Corneomandibular sign, movement of the lower jaw toward the side opposite the eye whose cornea is lightly touched, the mouth being open. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Corneomental sign, unilateral wrinkling of the muscles of the chin when pressure is applied to the cornea. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Corneopterygoid sign, movement of the lower jaw toward the side opposite the eye whose cornea is lightly touched, the mouth being open. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Corn-stalk sign, a disease of cattle characterized by enteritis and septicemia due to a bacillus. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Coronary sign, the reflex that controls the caliber of the coronary blood vessels. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Corpse sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] necrophobia, the morbid fear of dead bodies. (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Corrigan's sign, [Sir Dominic John Corrigan, Irish physician, 1802-1880] 1. a purple line at the junction of the teeth with the gum. A sign of chronic copper poisoning. 2. a peculiar expanding pulsation. A sign indicating an aneurysm of the abdominal aorta. Also known as Corrigan's pulse. (Corrigan) (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*) (*Cardiovascular*)

Corrigan's Cardiac sign, [Sir Dominic John Corrigan, Irish physician, 1802-1880] aortic incompetency. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*IMD* 1974) (*Cardiovascular*)

Cortical Rim sign, with perfused kidney tomography only the thin cortex rim is visible indicating non-perfusion to the other parts of the cortex. Also known as Rim sign. (*ARPS* 1990) (*Renal Reproductive*) (*Cardiovascular*)

Cotard's sign, [Jules Cotard, French neurologist, 1840-1889] the individual with the disease feels they are dead. Often the sufferer believes they have lost all of their blood and internal organs. The condition has been associated with depression. Also known as Walking Corpse syndrome. (*ARPS* 1990) (*Neurologic*)

Cotton sign, the patient presents with cotton in the ear, complaining of solely a deep earache. This is often a sign of referred lingual pain caused by advanced carcinoma of the tongue. (*ARPS* 1990) (*Oncology*) (*Otolaryngology*) (*Oral Maxillofacial*)

Cotugno's sign, [Domenico Cotugno, Italian anatomist, 1736-1822] sciatica. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Cough Reflex sign, the sequence of events initiated by the sensitivity of the lining of the passageways of the lung and mediated by the medulla as a consequence of impulses transmitted by the vagus nerve, resulting in coughing, i.e., the clearing of the passageways of foreign matter. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Coughing sign, the patient is recumbent, with his legs hanging over the edge of a table, and is told to cough. If the coughing produces flexion of the thigh and extension of the leg in the paralyzed limb, it indicates that the paralysis is due to an upper motor neuron lesion. Also known as Huntington's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Courvoisier's sign, [Ludwig Georg Courvoisier, Swiss surgeon, 1843-1918] the gallbladder is dilated when the common bile duct is obstructed, but it is a rare phenomenon to be dilated because of being obstructed by a stone. Also known as Courvoisier's law. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Couton's sign, tuberculous spondylosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Corvisart's sign, [Baron Jean Nicolas Corvisart des Marets, French physican, 1755-1821] 1. the facies associated with cardiac insufficiency. 2. hypertrophic myocarditis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Cowen's sign, jerky constriction of the contralateral pupil when light is shown into the pupil, a sign of Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Coyote sign, a rare zoonotic Brucella disease from coyotes and dogs. (*ARPS* 1990) (*Infectious disease Immunology*)

Crab Tuberculosis sign, a zoonotic pulmonary disease that resembles tuberculosis and can sometimes have CNS and dermatologic involvement. Caused by the ingestion

of undercooked crabs and crayfish containing the *Paragonimus* fluke. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Nutritional*) (*Neurologic*)

Crack Teeth sign, the front teeth are often missing, black and broken down, due to the heat and dry mouth associated with smoking methamphetamine. Also known as Meth Mouth sign. (*ARPS* 1990) (*Oral Maxillofacial*)

Cracked Pot sign, [Sir William Macewen, Scottish surgeon, 1848-1924] on percussion of the skull if there is found a cracked pot note, this is a sign of extensive fracture from base to the vertex. (*ARPS* 1990) (*Muscular Skeletal*)

Cranial sign, any reflex whose paths are connected directly with the brain. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Craniotabes sign, deformity of the head, together with pigeon-breast and various spinal curvature. An indication of rachitis. (*AACM* 1896) (*ARPS* 1990) (*Nutritional*) (*Muscular Skeletal*)

Craw Craw sign, a form of pustular eczema found in West Africa. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Cremasteric sign, stimulation of the skin on the front and inner side of the thigh retracts the testis on the same side. The presence of this reflex indicates integrity of the first lumbar nerve segment of the spinal cord or its root; absence indicates damage of the first lumbar nerve segment or its root or lesion of the corticospinal tract. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Renal Reproductive*)

Crescent sign, the radioscopic appearance of a crescentic shadow made by the crater of a gastric ulcer: when the convexity of the crescent points outward the ulcer is on the lesser curvature; when the convexity points downward the ulcer is distal to the angular incisure. Also known as Carman's sign and Meniscus sign. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Crescentic Notch sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] there are depressions or notching of the incisal edges of the labial surfaces of the permanent incisors. A sign of congenital syphilis. Also called Hutchinson's Incisor sign and Screwdriver Teeth sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Cretin sign, pediatric hypothyroidism. (*ARPS* 1990) (*Endocrine*) (*Otolaryngology*)

Crichton-Browne's sign, [Sir James Crichton-Brown, Scottish physician, 1840-1938] tremor of the outer angles of the eyes and of the labial commissures. A sign seen in the

earlier stages of paretic dementia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Crossed sign, stimulation upon one side of the body makes a reflex on the other side. Also called Consensual reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Crowe's sign, freckling found in the axillary as an indication of neurofibromatosis. (*ARPS* 1990) (*Dermatologic*) (*Neurologic*)

Crown of Venus sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] crescent shaped display on the forehead, a presentation of syphilis. (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Cruveilhier's sign, [Jean Cruveilhier, French pathologist, 1791-1874] a swelling in the groin is palpated when the patient coughs: in saphenous varix there is felt a tremor as of a jet of water entering and filling the pouch. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

Cruveilhier's Disease signs, [Jean Cruveilhier, French pathologist, 1791-1874] 1. progressive muscular atrophy. 2. ulceration of the stomach due to excess of acid and local anemia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Gastrointestinal*)

Cuboidodigital sign, percussion of the dorsum of the foot normally causes dorsal flexion of the second to fifth toes; in certain organic nervous conditions it causes plantar flexion of the toes. Also known as the Mendel-Bekhterev reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Cuckoopint sign, purging, cold clammy skin, with swelling of the tongue. Indicates poisoning from arum maculatum. Also known as Arum Maculatum sign. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Dermatologic*)

Cucumber sign, the presence of tapeworm proglottids in faeces due to the ingestion of cat or dog fleas. This is a sign found in dipylidiasis caused by the zoonotic *Dipylidium caninum*. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*)

Cullen's sign, [Thomas Stephen Cullen, Canadian gynecologist, 1868-1953] a blueish discoloration of the periumbilical skin. A sign of subcutaneous intraperitoneal haemorrhage, possibly from ruptured ectopic pregnancy or acute pancreatitis. Also known as Hellendall's sign. (Cullen 1916) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*) (*Hematologic*)

Curschmann's sign, [Heinrich Curschmann, German physician, 1846-1910] the frosted liver. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Cushing's sign, [Harvey Williams Cushing, American surgeon, 1869-1939] a rise in systemic blood pressure as a result of an increase in intracranial pressure. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Cutaneous sign, a sign in which stimulation of the skin causes wrinkling. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Cutaneous Pupillary sign, dilatation of the pupil on pinching the skin of the cheek or neck. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Dermatologic*)

Cyclops' sign, synophthalmus monster. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*)

Cysticercus sign, an affection due to the presence of the larval forms of the zoonotic pork tapeworm. Also called pork measles. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

DaCosta's sign, [Jacob Mendes DaCosta, American physician, 1833-1900] retrocedent gout. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Dakotas sign, the tribe of the Dakotas may amputate a finger, which is a sign of religious or ceremonial mutilation. (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*)

Dale's sign, [Sir Henry Hallett Dale, Nobel laureate, British physiologist, 1875-1968] Dale's phenomenon or reaction. (*IMD* 1974) (*ARPS* 1990)

Dalrymple's sign, [John Dalrymple, English ophthalmologist, 1803-1852] an abnormal wideness of the palpebral opening. A sign in exophthalmic goiter. (Dalrymple 1852) (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Ophthalmic*) (*Otolaryngology*)

Damaras sign, a sign of cosmetic mutilation when a wedge shaped gap is filed or knocked out between two of the front teeth. Also seen in native peoples of Sierra Leone. (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

D'Amato's sign, in pleural effusion, the location of dullness is altered from the vertebral area in the sitting position to the heart region when the patient assumes a lateral position on the side opposite the effusion. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Damoiseau's sign, [Louis Hyacinthe Céleste Damoiseau, French physician, 1815-1890, Calvin Ellis, American physician, 1826-1883] the discovery of the peculiar curved line of dulness. A sign of resorption of a pleuritic exudate. Also known as Ellis's line and Ellis's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Dance's sign, [Jean Bapiste Hippolyte Dance, French physician, 1797-1832] a depression in the right iliac region. A sign of intussusception. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Dancing sign, tarantism. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Poisoning*) (*Neurologic*)

Dancing Madness sign, c. 1374, dancing in wild delirium often for many hours accompanied with an irrational fear of demons and drowning in blood, as well as, sometimes visions of heaven and the Savior enthroned with the Virgin Mary. An indication of ergot poisoning. Also known as *chorus sancti viti*, the lascivious dance, choromania, tanzplage, and orchestromania. (Paracelsus) (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Poisoning*) (*Neurologic*)

Danielson's sign, anesthetic leprosy. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Danysz's sign, [Jan Danysz, Polish-French pathologist, 1860-1928] decrease of the neutralizing influence of an antitoxin when a toxin is added to it in divided portions instead of all at once. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Poisoning*)

Dapaong sign, fever and multi-nodular disease of the colon caused by infection with the zoonotic *Oesophagostomum bifurcum* roundworm. The infected larvae can be transferred from primates. (*ARPS* 1990) (*Infectious disease Immunology*)

Darier's sign, [Ferdinand Jean Darier, French dermatologist, 1856-1938] stroking of the skin results in erythema and edema. A sign in urticaria pigmentosa. (Darier 1909) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Darier's Disease sign, [Ferdinand Jean Darier, French dermatologist, 1856-1938] keratosis follicularis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Dartos sign, the patient stands with his feet wide apart and the examiner suddenly applies cold to the perineum; the dartos muscle undergoes vermicular contraction. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Davidsohn's sign, [Hermann Davidsohn, Prussian physician, 1842-1911] the reflection of light through the pupil in transillumination. A sign seen in normal health. Also called Davidson's reflex. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Davis's sign, an empty state and a yellowish or pale tint of the pulseless arteries. A sign of death. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Death*)

Dawbarn's sign, [Robert Hugh Mackay Dawbarn, American surgeon, 1860-1915] in acute subacromial bursitis, when the arm hangs by the side palpation over the bursa causes pain, but when the arm is abducted this pain disappears. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Dead-finger sign, [Maurice Raynaud, French physician, 1834-1881] a cold pale condition of the fingers and toes alternating with heat and redness. An early sign of asymmetric gangrene or Raynaud's disease. Also known as acro-asphyxia or Raynaud's sign. (Raynaud) (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Débove'sign, [Georges Maurice Débove, French physician, 1845-1920] splenomegaly. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*)

Debre's sign, absence of measles rash at the site of injection of convalescent measles serum which has not prevented the appearance of the eruption. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

De Brun's sign, pneumopaludism. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Deep Red Hair sign, the deep reddish brown hair found in handlers of crude aniline. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Poisoning*)

Deep Reflex sign, any reflex elicited by irritating a deep structure. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Defecation sign, the process by which the accumulation of faeces in the rectum excites defecation; called also Rectal Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Defense sign, contraction and extension motions in a paralyzed limb produced by plantar flexion of the toes. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Defrutum sign, delirium and chronic lead poisoning from sweet defrutum and sapa boiled in lead pots. Lead has also been used in cosmetics and to sweeten food and wine. (*ARPS* 1990) (*Poisoning*) (*Nutritional*)

Dejerine's sign, [Joseph Jules Dejerine, French neurologist, 1849-1917] aggravation of symptoms of radiculitis produced by coughing, sneezing, and straining at stool. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Gastrointestinal*)

Dejerine's Disease sign, [Joseph Jules Dejerine, French neurologist, 1849-1917] hypertrophic interstitial neuritis in infants. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Dejerine-Lichtheim sign, [Joseph Jules Dejerine, French neurologist, 1849-1917, Ludwig Lichtheim, German physician, 1845-1928] thermal and tactile sensations in the gums with toothache, produced by repeated faradic stimulation of hyperesthetic lines on the body (Calligaris). Also known as Lichtheim sign and Dental phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

de la Camp's sign, relative dullness over and at each side of the fifth and sixth vertebrae in tuberculosis of the bronchial lymph nodes. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Delayed sign, a reflex which occurs some time after the stimulus provoking it has been received. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Delbet's sign, [Pierre Delbert, French surgeon, 1861-1925] aneurysm of the main artery of a limb, if the nutrition of the part distal to the aneurysm is maintained, although the pulse may have disappeared, the collateral circulation is sufficient. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Delhi Boil sign, [India] fever, pancytopenia, hepatosplenomegaly, caused by the zoonotic transmission of the protozoal *Leishmania* species by the bite of phlebotomine sand flies. The disease can exist in visceral, cutaneous, and mucosal forms. (*ARPS* 1990) (*Infectious disease Immunology*)

Delmege's sign, deltoid flattening; said to be an early sign of tuberculosis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Demarquay's sign, [Jean Nicholas Demarquay, French surgeon, 1811-1875] a fixation or lowering of the larynx during phonation and deglutition. A sign of syphilis of the trachea. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Otolaryngology*)

Demianoff's sign, a sign that permits the differentiation of pain originating in the sacrolumbalis muscles from lumbar pain of any other origin. The sign is obtained by placing the patient in dorsal decubitus and lifting his extended leg. In the presence of lumbago this produces a pain in the lumbar region which prevents raising the leg high enough to form an angle of 10 degrees, or even less, with the table or bed on which the patient reposes. The pain is due to the stretching of the sacrolumbalis. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

de Morgan's sign, [Campbell de Morgan, English physician, 1811-1876] reddish spots associated with cancer. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*) (*Dermatologic*)

de Musset's sign, the presence in the left hypochondriac region of a spot intensely painful on pressure. A sign indicating diaphragmatic pleurisy. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

de Mussy's sign, an area to the left border of the sternum, at the tenth rib level, very painful on pressure. A sign of diaphragmatic pleurisy. Also known as de Mussy's point. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Dennie's sign, [Charles Clayton Dennie, American dermatologist, 1883-1971] a secondary crease in the lower eye lids. A sign of atrophic dermatitis. Also known as Morgan's line. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Ophthalmic*)

Denys-Ledef sign, [Joseph Denys, Belgian bacteriologist,—1932] phagocytosis taking place in a test tube on mixing therein leukocytes, bacteria, and immune serum specific for the bacteria. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Depressor sign, a reflex to stimulation resulting in decreased activity of the motor center. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Dercum's sign, adiposis dolorosa. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Desault's sign, [Pierre Joseph Desault, French surgeon, 1744-1795] the alteration of the arc described by rotation of the great trochanter, which normally describes the segment of a circle, but in this case rotates only as the apex of the femur as it rotates about its own axis. A sign indicating intracapsular fracture of the femur. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Desnos's sign, [Louis Joseph Desnos, French physician, 1828-1893] splenopneumonia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

d'Espine's sign, [Jean Henri Adolphe d'Espine, French physician, 1846-1930] in the normal person, on auscultation over the spinous processes, pectoriloquy ceases at the bifurcation of the trachea, and in infants opposite the seventh cervical vertebra. If pectoriloquy is heard lower than this, it indicates enlargement of the bronchial lymph nodes. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Devergie's sign, [Marie Guillaume Alphonse Devergie, French physician, 1798-1879] pityriasis rubra. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Devonshire Colic sign, [Sir George Baker, c.1767] lead poisoning from the cider apparatus as a cause of colic. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Dew's sign, in diaphragmatic hydatid abscess beneath the right cupola, the area of resonance moves caudally with the patient on hands and knees. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Dew Poisoning sign, pustular desquamative dermatitis, caused by the zoonotic fungal *Dermatophilus congolensis*. Found in horses, cattle, sheep, deer, and other mammals worldwide. Also called Rain Scald sign and Rain Rot sign. (*ARPS* 1990) (*Infectious disease Immunology*)

d'Herelle's sign, [Felix Hubert d'Herelle, French bacteriologist, 1873-1949] the movement of the diaphragm as seen through the walls of the body; called also phrenic phenomenon, phrenic wave, Twort-d'Herelle phenomenon or sign, diaphragm phenomenon, and diaphragmatic phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Dickinson's sign, [William Howship Dickinson, British physician, 1832-1913] blue saliva. (Dickinson 1884) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Dietl's sign, [Józef Dietl, Polish physician, 1804-1878] acute hydronephrosis due to nephroptosis. Also called Dietl's crisis and floating kidney. (*ARPS* 1990) (*Renal Reproductive*)

Digital sign, a sudden nipping of the nail of the index, middle, or ring finger produces flexion of the terminal phalanx of the thumb and of the second and third phalanx of some other finger; called also Hoffmann's reflex, and Tromner's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Dilantin sign, hyperplastic gingival enlargement, that resembles hereditary gingival fibromatosis, occurs in patients using phenytoin for the control of epilepsy. (*ARPS* 1990) (*Oral Maxillofacial*)

Dinner Fork sign, [Abraham Colles, Irish surgeon, 1773-1843] Colles's fracture of the wrist. (*ARPS* 1990) (*Muscular Skeletal*)

Direct sign, a contraction on the same side as that of the stimulation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Direct Light sign, when a ray of light is thrown upon the retina through the pupil there is immediate contraction of the sphincter iridis, reducing the size of the pupillary aperture. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Dirt Eater's sign, visceral larva migrans, fever, rash, and eye lesions that mimic retinoblastoma. Infection is from eating dirt which contains the embryonic eggs of the zoonotic *Toxocara* roundworms in dog and cat faeces. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Ophthalmic*)

Distal Tingling on Percussion sign, [Jules Tinel, French neurologist, 1879-1952] a tingling sensation in the distal end of a limb when percussion is made over the site of a divided nerve. It indicates a partial lesion or the beginning regeneration of the nerve. Also known as D.T.P. sign, Formication sign, and Tinel's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Dixon Mann's sign, [John Dixon Mann, English physician, 1840-1912] 1. in Graves' disease the two eyes appear not to be on the same level. 2. lessened resistance of the scalp to a constant electric current; seen in certain traumatic neuroses. Also known as Mann's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Neurologic*)

DNA Fever sign, invasive pneumonia and brain abscess, from exposure to the zoonotic *Nocardia asteroides* and it's subspecies, seen in immunocompromised patients. (*ARPS* 1990) (*Infectious disease Immunology*)

Dobrava sign, rapid fever, kidney failure, severe back pain, and bleeding rash which progresses to death in 15 percent of victims. Caused by a zoonotic hantaviral infectious process known as hemorrhagic fever with renal syndrome. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Renal Reproductive*) (*Dermatologic*) (*Death*)

Dobrizhoffer's sign, at age seven Abipones boys pierce their arms in imitation of their parents. This is a sign of cosmetic mutilation. (Dobrizhoffer) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Dog sign, when a dog trained to detect cancer has a positive finding from smelling a patient's skin, breath, urine, etc. (*ARPS* 1990) (*Oncology*)

Dog Spit sign, sepsis possibly leading to death in alcoholics, that have been exposed to the zoonotic *Capnocytophaga canimorsus* bacteria in the mouth of cats and dogs. (*ARPS* 1990) (*Infectious disease Immunology*)

Doll's Eye sign, dissociation between the movements of the head and eyes: as the head is raised the eyes are lowered, and vice versa. Also known as Cantelli's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Doll's Eye Reflex sign, when the premature infant's head is rotated laterally, the eyes are pulled synergistically in the opposite direction, then return to the middle of the palpebral fissure. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Doll's Head sign, an abnormal extraocular muscle manifestation of many ophthalmologic syndromes and conditions: the eyes depress as the head is bent backward. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Donath's sign, blood from a person with paroxysmal hemoglobinuria if cooled to 5 degrees C. outside the body and then warmed to body temperature undergoes hemolysis. Also called the Donath-Landsteiner phenomenon or test. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Donatus's sign, yellow saliva. (Donatus 1586) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

Dooley's sign, [Denis Dooley, English physician] the crepitus of surgical emphysema, feels like palpating a horse-hair mattress. Also known as Horse-Hair sign. (*ARPS* 1990) (*Dermatologic*)

Dorendorf's sign, [Hans Dorendorf, German physician, 1866—] fullness of the supraclavicular groove on one side in aneurysm of the aortic arch. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Cardiovascular*)

Dorsal Skin sign, contraction of the back muscles in response to stimulation of the skin along the erector spinae. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Dorsocuboidal Reflex sign, percussion of the dorsum of the foot normally causes dorsal flexion of the second to fifth toes; in certain organic nervous conditions it causes plantar flexion of the toes. Called also Mendel-Bekhterev reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Double Bubble sign, the appearance of two foci of gas on abdominal radiography with duodenal obstruction. (*ARPS* 1990) (*Gastrointestinal*)

Dougan-Bird's sign, [Samuel Dougan Bird, Australian physician, 1832-1904] defined area of dulness and absence of respiratory sounds. A sign of hydatid cysts in the lungs or liver, caused by tapeworms. Also known as Bird's sign, Doncan-Bird's sign, and Duncan-Bird's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Gastrointestinal*) (*Infectious disease Immunology*)

Dover's Powder sign, [Thomas Dover, English physician and explorer, 1660-1742] pin-point pupils, muscular limpness, face pale or blue. Indication of opium poisoning. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Poisoning*)

Dracula's sign, [Vlad Dracul, 15th century] severe mutilating skin lesions caused by photosensitivity, neurological disruptions, liver pathology, and strange purple urine. These are indications of forms of porphyria. It is now suggested that Vlad Dracul the 15th century slayer prince, also known as Vlad the Impaler suffered from hereditary porphyria. There is supporting evidence that some sufferers craved blood due to iron deficiency. Coupled with the fact that the disease can be manifested with painful cutaneous photosensitivity, allowing some victims to only come out after dark caused them to be sadly mistaken for vampires. Also called Vampire's disease or sign. (*ARPS* 1990) (*Dermatologic*) (*Genetic*) (*Renal Reproductive*) (*Gastrointestinal*)

Dragon Boat sign, bovine ephemeral fever caused by an arthopod-borne rhabdovirus. Mortality can approach 30 percent. Also called Three-day sign, Stiffsickness sign, and Stiff sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Drawer sign, a test to check for rupture of the cruciate ligament of the knee. With the leg flexed at 90 degrees the tibia is then pulled forward, if it does move more than normal, this indicates rupture. Also known as Anterior Drawer sign. (*ARPS* 1990) (*Muscular Skeletal*)

Dressler's sign, [Dressler, German physician] recurrent hemiglobinuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Hematologic*)

Drooping Lily sign, with obstruction of the upper collecting system seen in kidney urography, the ureter and lower collecting system have the appearance of a drooping lily. (*ARPS* 1990) (*Renal Reproductive*)

Drummond's sign, [Sir David Drummond, English physician, 1852-1932] a whiff heard at the open mouth during respiration. A sign found in cases of aortic aneurysm. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Respiratory*) (*Cardiovascular*)

D.T.P. sign, [Jules Tinel, French neurologist, 1879-1952] a tingling sensation in the distal end of a limb when percussion is made over the site of a divided nerve. It indicates a partial lesion or the beginning regeneration of the nerve. Also known as Distal Tingling on Percussion sign, Formication sign, and Tinel's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Dubini's sign, [Angelo Dubini, Italian physician, 1813-1902] electric chorea. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Du Bois's sign, [Paul Dubois, French obstetrician, 1795-1871] shortness of the little finger in congenital syphilis. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Dubois's Chest sign, [Paul Dubois, French obstetrician, 1795-1871] the development of multiple abscesses in the thymus gland in congenital syphilis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Duchenne's sign, [Guillaume Benjamin Amand Duchenne, French neurologist, 1806-1875] during inspiration there is sinking in of the epigastrium. A sign paralysis of the diaphragm and sometimes certain cases of hydropericardium. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*) (*Gastrointestinal*) (*Neurologic*)

Duckworth's sign, [Sir Dyce Duckworth, British physician, 1840-1928] the breathing stops before the heart stops, seen in certain fatal brain conditions. Also known as Duckworth's phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*) (*Neurologic*) (*Death*)

Duct sign, a red spot seen at the orifice of the parotid duct in mumps. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Dufourmentel's sign, [L. Dufourmentel, French surgeon] the receding chin and characteristic shrewmouse profile as a sign of pediatric ankylosis of the temporomandibular joint. Also known as Shrewmouse sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Dugas's sign, [Louis Alexander Dugas de Vallon, American surgeon, 1806-1884] the patient places the hand of the affected side on the opposite shoulder and brings the elbow to the side of the chest. If this cannot be done there is a dislocation of the shoulder. Also known as Dugas's test. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Duhring's sign, [Louis Adolphus Duhring, American dermatologist, 1845-1913] dermatitis herpetiformis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Duke's sign, [Clement Dukes, English physician, 1845-1925] an alleged exanthematous contagious disease resembling rubella, scarlatina, and measles. It is marked by lamellar desquamation of the skin. Also called Fourth sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Duncan-Bird's sign, [Samuel Dougan Bird, Australian physician, 1832-1904] defined area of dulness and absence of respiratory sounds. A sign of hydatid cysts in the lungs or liver, caused by tapeworms. Also known as Bird's sign and Dougan-Bird's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Gastrointestinal*) (*Infectious disease Immunology*)

Dung Beetle Death sign, gut perforation caused by the ingestion of *Melolontha* beetles that are infected with the zoonotic *Macracanthorhynchus* worms. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*)

Du Noüy's sign, the addition of sodium oleate to blood serum reduces the surface tension of the serum for a short time only. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Dunphy's sign, injection anterior to the insertion of the lateral rectus in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Endocrine*)

Dupré's sign, [Ernest Dupré, French physician, 1862—] emotional psychoneurosis that is not caused by hysteria. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Dupuytren's sign, [Baron Guillaume Dupuytren, French surgeon, 1777-1835] 1. a crackling sensation on pressure over a sarcomatous bone. 2. in congenital dislocation of the head of the femur, there is a free up-and-down movement of the head of the bone. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Dupuytren's Contracture sign, [Baron Guillaume Dupuytren, French surgeon, 1777-1835] contracture of the fourth or fifth digits from fibrous tissue proliferation in to the palmar fascia. Seen in patients with chronic alcoholic liver disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Gastrointestinal*)

Duroziez's sign, [Paul Louis Duroziez, French physician, 1826-1897] a double murmur heard over a large peripheral artery or mainly the femoral. A sign of aortic insufficiency. Also known as Duroziez's murmur. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Duroziez's Disease sign, [Paul Louis Duroziez, French physician, 1826-1897] congenital mitral stenosis. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Dutton's sign, [J. Everett Dutton, English physician] relapsing fever caused by a West African tick. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Duvenhage Fever sign, [South Africa] encephalitic illness with near 100 percent mortality. Caused by a zoonotic rabies lyssavirus carried by infected micro bats. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Death*)

Dynamite sign, [Dahlonega, Georgia, c. 1828] a headache described like no other, severe throbbing, tingling in extremities, pale blue lips. Caused by exposure to toluene and acid fumes when entering recently exploded caves for gold excavation. (*ARPS* 1990) (*Respiratory*) (*Neurologic*) (*Poisoning*)

E sign, on radiography of the aorta, there appears to be a pair of bulges indicating coarctation. Also known as Figure Three sign, Reversed Three sign and Three sign. (*ARPS* 1990) (*Cardiovascular*)

Ear-Sneezing sign, [Edward Woakes, English physician, 1837-1912] sneezing due to the caking of cerumen in the ear causing irritation of the auricular branch of the vagus. Also called Woakes's sign. (Woakes 1880) (*AACM* 1896) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

East India sign, furunculus orientalis, sharply punched-out ulcer often on the face, feet and the backs of the hands, with deep scar. Found among the tea trade routes. Also known as Oriental boil, Aleppo boil, Delhi boil, and Biskra button. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Ebola sign, [Africa] rapid viral symptoms accompanied with maculopapular desquamative rash, red eyes, hiccups, and internal or external haemorrhage. Mortality can be 90 percent, caused by the zoonotic Ebola hemorrhagic fever *Filoviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Dermatologic*) (*Hematologic*) (*Death*)

Ebstein's sign, [Wilhelm Ebstein, German physician, 1836-1912] hyalin degeneration and necrosis of the epithelial cells of the renal tubules: seen in diabetes. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Endocrine*)

Echinococcus-disease sign, hydatid disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Echo sign, 1. the repetition of the last word or clause in a sentence. A sign of certain brain diseases. 2. a percussion sound resembling an echo which is heard over a hydatid

cyst. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*) (*Infectious disease Immunology*)

Eczema sign, [Sir James Paget, English surgeon, 1814-1899] eczema of the areola as a sign preceding cancer of the breast. Also known as Paget's Eczema sign. (Paget 1874) (*ARPS* 1990) (*Dermatologic*) (*Oncology*)

Edsall's sign, [David Linn Edsall, American physician, 1869—] heat cramps. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

EEC sign, enterohemorrhagic *Eschericha coli*. A zoonotic bacteria found in cattle and humans, causes hemolytic uremic syndrome. Usually acquired thru the ingestion of undercooked ground beef. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Nutritional*) (*Death*)

Effortless Vomiting sign, vomit comes up effortlessly by the mouthful. A sign seen in established peritonitis. (*ARPS* 1990) (*Gastrointestinal*)

Egyptian sign, [Baron Dominique Larrey, French surgeon, 1766-1842] atrophy and disappearance of the testicle, sometimes both are involved, and subjects occasionally become mentally deranged. Also called Larrey's sign. (Larrey) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*) (*Neurologic*)

Ehret's sign, [Heinrich Ehret, German physician, 1870—] a form of paralysis of the peronei muscles. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Ehrlich's sign, [Paul Ehrlich, Nobel laureate, German physician, 1854-1915] human monocytic ehrlichiosis or human granulocytic ehrlichiosis, caused by a zoonotic tick borne bacterium. Principle animals are deer, horses, dogs, and rodents found in the USA and Japan. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Eichhorst's sign, neuritis fascians. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Eichstedt's sign, [Karl Ferdinand Eichstedt, German physician, 1816-1892] tinea versicolor. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Eight Days sign, [Sir William Osler, Canadian physician, 1849-1919] a sign of tetanus neonatorum as it usually appears at eight days due to umbilical sepsis. In Africa and the

West Indies it is a ceremonial custom to place dung on the umbilical cord of newborns spreading the infection. (*ARPS* 1990) (*Infectious disease Immunology*)

Eighth Nerve sign, clinical test of the vestibulocochlear cranial nerve; can the patient hear? (*ARPS* 1990) (*Neurologic*)

Elbow sign, thickening of the ulnar nerve at the elbow. A sign of tuberculoid leprosy. Also known as Ulnar Leprosy sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Elbow Reflex sign, extension of the forearm on tapping of the triceps tendon at the elbow while the forearm hangs limp at right angles to the arm. Also known as Triceps Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Elephant Heart sign, acute myocarditis from exposure to the zoonotic encephalomyocarditis picornavirus. Elephants are a known host and they are usually infected by eating feed that has been contaminated with rat urine containing the virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Cardiovascular*)

Eleventh Nerve sign, clinical test of the accessory cranial nerve; can the patient shrug their shoulders? (*ARPS* 1990) (*Neurologic*)

Elliot's sign, [George T. Elliot, American dermatologist, 1851-1935] 1. induration of the edge of a syphilitic skin lesion. 2. a scotoma extending from the blind spot and made up of numerous points or spots. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*) (*Ophthalmic*)

Ellis's sign, [Louis Hyacinthe Celeste Damoiseau, French physician, 1815-1890, Calvin Ellis, American physician, 1826-1883] the discovery of the peculiar curved line of dulness. A sign of resorption of a pleuritic exudate. Also known as Damoiseau's sign and Ellis's line. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Ely's sign, [Leonard Wheeler Ely, American orthopaedic surgeon, 1868-1944] with the patient lying face downward, flexion of the leg on the thigh causes the leg to abduct at the hip joint and raise the buttocks, there is contracture of the lateral fascia of the thigh. Also known as Ely's test. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Embracer sign, on placing an infant on a table and then forcibly striking the table on either side of the child, the arms are suddenly thrown out in an embrace attitude; called also Moro's Reflex sign and Startle Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Emergency Light sign, excessive stimulation of the retina by light produces contraction of the pupils, closure of the eyelids, and lowering of the eyebrows. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Emeryaki sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Emptying sign, on compression a swelling greatly diminishes. A sign of haemangioma, lymphangiomata, and meningoceles. (*ARPS* 1990) (*Cardiovascular*)

Enamel Pearls sign, small masses of enamel found most frequently at the root bifurcation of molar teeth. Have the distinct appearance of pearls. (*ARPS* 1990) (*Oral Maxillofacial*)

Enroth's sign, abnormal fullness of the eyelids in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Enterogastric sign, inhibition of gastric motility when irritants enter the duodenum. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

EPE sign, zoonotic *Mycoplasma haemolamae* infection, eperythrozoonosis, causes hemolytic fever and jaundice. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Epigastric sign, a withdrawal or spasm of the skin of the epigastrium, caused by stimulating its surface or that of the fifth and sixth intercostal spaces near the axilla. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Gastrointestinal*) (*Dermatologic*)

Epstein's Pearl sign, [Alois Epstein, German paediatrician, 1849—] small epithelial masses resembling pearls on a newborn's palate. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*)

Epstein-Pihl sign, [Alois Epstein, German paediatrician, 1849—] intermittent leukemia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*) (*Hematologic*)

Erb's sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921] 1. the increased electric irritability of the motor nerves. A sign of tetany. 2. dulness in percussion over the manubrium of the sternum. A sign of acromegalia. (Erb 1864) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Endocrine*)

Erb's Atrophy sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921] idiopathic muscular atrophy. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Erb-Charcot's sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921, Jean Marie Charcot, French physician, 1825-1893] spasmodic locomotor ataxia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Erb's Reflex sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921, Georges Charles Guillain, French neurologist, 1876-1961, Jean-Alexandre Barré, French neurologist, 1880-1967] biceps femoris reflex. Also called Guillain-Barré sign. (Erb 1875) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Erb-Westphal sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921, Alexander Karl Otto Westphal, Austrian neurologist, 1863-1941] loss of the patellar tendon reflex. Seen in tabes and other diseases of the brain and spine. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Erben's sign, [Siegmund Erben, Austrian neurologist, 1863—] temporary slowness of the pulse on stooping or sitting down. A sign said to characterize certain cases of neurasthenia and vagal excitability. Also known as Erben's phenomenon and reflex. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Erector Spinae sign, contraction of the erector spinae muscle on irritation of the skin along its border. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Erichsen's sign, [Sir John Eric Erichsen, English surgeon, 1818-1896] when the iliac bones are sharply pressed toward each other pain is felt in sacroiliac disease but not in hip disease. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Erichsen's Spine sign, [Sir John Eric Erichsen, English surgeon, 1818-1896] railway spine. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Erni's sign, the development of the cavernous tympany over an apical cavity. A sign that the cavity was previously filled with fluid. On discovery of a filled cavity the secretion can often be expelled by stimulating coughing. This can be achieved by gently rapping over the area with a hand instrument. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Ersatz Crohn's sign, violent abdominal pain, coughing, and eosinophilic granulomas in the intestine. This is initiated through the ingestion of undercooked fish, as well squid and octopus, known to be present in cod livers, sushi, sashimi, ceviche, and fermented herrings. The disease is caused by the parasitic zoonotic *Anisakis* roundworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Escherich's sign, [Theodor Escherich, German physician, 1857-1911] in tetany, percussion of the inner surface of the lips or tongue produces contraction of the lips, tongue, and masseter muscles. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*) (*Muscular Skeletal*)

Eskimo sign, the black facial appearance found in some Eskimo women. This is a sign of ceremonial matron tattooing of the face with lamp-black. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Esophagosalivary sign, salivation on irritation of the esophagus; also called Roger's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*) (*Gastrointestinal*)

Ether sign, a sign of death: 1 or 2 ml. of ether is injected subcutaneously. If the ether spurts back when the needle is withdrawn, death has occurred. Its absorption indicates that life still persists. (*IMD* 1974) (*ARPS* 1990) (*Death*)

Ether Intestinal sign, the sudden and increased flow of duodenal secretion following the introduction of ether and certain other substances into the duodenum. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Eustace Smith's sign, [Eustace Smith, British physician, 1835-1914] a murmur heard in cases of enlarged bronchial glands on auscultation over the manubrium with the patient's head thrown back. Also known as Smith's sign. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Evil sign, any sign of illness or disease. (*IMD* 1974) (*ARPS* 1990)

Ewart's sign, [William Ewart, English physician, 1848-1929] the undue prominence of the upper border of the first rib. A sign of pericardial effusion. (Ewart 1896) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Muscular Skeletal*)

Ewing's sign, [James Ewing, American pathologist, 1866-1943] tenderness at the upper inner angle of the orbit: a sign of obstruction of the outlet of the frontal sinus. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*) (*Oral Maxillofacial*)

External Auditory Meatus sign, closure of the eye as a result of tactile or thermal stimulation of the deepest part of the external auditory meatus and tympanum. Also known as Kisch's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

External Malleolar sign, [Charles Gilbert Chaddock, American neurologist, 1861-1936] extension of the great toe from stimulation below the external malleolus. A sign occurring in lesions of the pyramidal tract. Also known as Chaddock's reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Extinction sign, [Werner Schultz, German internist, 1878-1947, Willy Charlton, German physician, 1889—] extinction of the eruption over an area of skin about the size of the palm when normal human serum is injected intra cutaneously. Also known as Schultz-Charlton reaction. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Eyeball Compression sign, a slowing of the rhythm of the heart following compression of the eyes or pressure on the carotid sinus. A slowing of from 5 to 13 beats per minute is normal; one of from 13 to 50 or more is exaggerated; one of from 1 to 5 is diminished. If ocular compression produces acceleration of the heart, the reflex is called *inverted*. Also known as the Oculocardiac Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Cardiovascular*)

Eyeball-heart sign, a slowing of the rhythm of the heart following compression of the eyes or pressure on the carotid sinus. A slowing of from 5 to 13 beats per minute is normal; one of from 13 to 50 or more is exaggerated; one of from 1 to 5 is diminished. If ocular compression produces acceleration of the heart, the reflex is called *inverted*. Also known as the Oculocardiac Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Cardiovascular*)

Eyelid-closure sign, irritation of the conjunctiva closes the lids. Called also Corneal and Conjunctival reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Eyeshine sign, the patient's eye reflects light like an animal that has a *tapetum lucidum.* Indicates patient may have artificial lens implant from past injury or cataract. (*ARPS* 1990) (*Ophthalmic*)

Fabere sign, [Hugh Talbot Patrick, American neurologist, 1860-1938] Patrick's test movements of flexion, abduction, external rotation, and extension. A sign indicating arthritis of the hip. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Face sign, a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. Also known as Chvostek's sign, Face phenomenon, and Schultze's sign. (*TAIMD* 1909) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Facial sign, a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. Also known as Chvostek's sign, Face phenomenon, and Schultze's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Facial Coma sign, in coma from apoplexy, pressure on the eyeball causes contraction of the facial muscles on the side opposite to the lesion; in coma from toxic causes the reflex occurs on both sides. Called also Bulbomimic Reflex sign and Mondonesi's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Poisoning*)

Facial Furrow sign, [John Benjamin Murphy, American surgeon, 1857-1916] unilateral ankylosis of the temporomandibular joint, a sign found when the face is at rest, the facial furrows are more marked on the healthy side. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Faget's sign, [Jean Charles Faget, French physician, 1818-1884] a constant pulse rate is associated with a raising temperature or a constant temperature is associated with a failing pulse rate. A sign seen in yellow fever. Caused by the zoonotic mosquito-borne yellow fever virus. Baboons and monkeys are known hosts. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Infectious disease Immunology*)

Fahraeus's sign, [Robin Fahraeus, Swedish pathologist, 1888—] erythrocyte sedimentation rate phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Fajersztajn's Crossed Sciatic sign, when the leg is flexed, the hip can also be flexed, but the hip can not be flexed if the leg is held straight. Flexing the sound thigh with the leg straight caused pain on the affected side. A sign of sciatica. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Fall-and-rise sign, the drop in the number of bacteria that occurs at the beginning of drug treatment and the gradual rise that follows phenomenon, even while treatment continues. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Fan sign, spreading apart of the toes following the stroking of the sole of the foot; it forms part of the Babinski reflex. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Fat Pad sign, displacement of the fat beside the joint in elbow and knee radiography indicating fracture within the joint. (*ARPS* 1990) (*Muscular Skeletal*)

Fatigue-disease sign, a febrile attack due to overexercise and the absorption of waste products. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Fauchard's sign, [Pierre Fauchard, French surgeon, 1678-1761] alveolodental periostitis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Faucial sign, irritation of the fauces causes vomiting. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Gastrointestinal*)

Fecal Placental sign, if the placenta has a fecal odor, there is a possible infection with *Fusobacterium necrophorum* or *Bacteroides fragilis*. See Sweet Placental sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*)

Fecal Vomit sign, vomit with the odor of faeces. A sign found in late intestinal obstruction. (*ARPS* 1990) (*Gastrointestinal*)

Fede's sign, [Francesco Fede, Italian physician, 1832-1913] Riga's disease of sublingual papilloma in infants. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*)

Federici's sign, [Cesare Federici, Italian physician, 1838-1892] on auscultation of the abdomen, the cardiac sounds can be heard in cases of intestinal perforation with gas in the peritoneal cavity. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Cardiovascular*)

Femoral sign, irritation of the skin on the upper anterior aspect of the thigh flexes the foot and first three toes and extends the knee. Also called Remak's Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Fenwick's sign, [Samuel Fenwick, English physician, 1821-1902] primary atrophy of the stomach. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Fèvre's sign, [Marcel Paul Lui Edmond Fèvre, French surgeon, Denys Pellerin, French pediatric surgeon, 1897—] a combined roentgenological and clinical sign of intestinal invagination in infants. (Fèvre and Pellerin 1959) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*)

Fibula sign, thickening of the lateral peroneal nerve around the fibula. A sign of tuberculoid leprosy. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Muscular Skeletal*)

Fick's sign, a fogging of vision, with the appearance of halos around light, a phenomenon occurring in individuals wearing contact lenses. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Fiedler's sign, [Carl Ludwig Alfred Fiedler, German physician, 1835-1921] severe leptospirosis; also called Weil's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Fifth Nerve sign, clinical test of the trigeminal cranial nerve; can the patient clench their teeth? (*ARPS* 1990) (*Neurologic*)

Figure Three sign, on radiography of the aorta there appears to be a pair of bulges indicating coarctation. Also known as E sign, Reversed Three sign and Three sign. (*ARPS* 1990) (*Cardiovascular*)

Filatov's sign, [Nil Feodorovich Filatov, Russian paediatrician, 1847-1902] 1. contraste entre la paleur des ailes du nez, des levres et du menton, et la rougeur intense des joues, dans l'eruption de la scarlatine. 2. infectious mononucleosis. Also known as Filatow's disease or sign. (Filatov 1885) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Filatow-Duke's sign, [Nil Feodorovich Filatov, Russian paediatrician, 1847-1902, Clement Dukes, English physician, 1845-1925] an alleged exanthematous contagious disease resembling rubella, scarlatina, and measles. It is marked by lamellar desquamation of the skin. Also called Fourth sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Filipovitch's sign, [Casimir Filipovitch, Polish physician] the yellow discoloration of prominent parts of the palms and soles. A sign of typhoid fever. Also known as Filipowicz's sign and Palmoplantar's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Filipowicz's sign, [Casimir Filipovitch, Polish physician] the yellow discoloration of prominent parts of the palms and soles. A sign of typhoid fever. Also known as Filipovitch's sign and Palmoplantar's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Filth-disease sign, [Edward Headlam Greenhow, English physician, 1814-1888] described as: a disease due to dirt and unclean habits. Has been associated with immune mediated responses and zoonotic disease transmissions from humans sharing sleeping quarters and bed linens with animals. These habits place people in prolonged direct contact with allergenic pet hair and dander, that also contain embryonic (eggs) and adult forms of fleas, mites, ticks, lice, and multiple related mange conditions. The pathogenic bacteria, fungi, worms, viruses, and allergens may be carried directly by the host animal or and their associated parasites, or both. See also Vagabond's sign and Vagrant's sign. (Greenhow) (Thibierge) (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Finger sign, a phenomenon seen in incomplete hemiplegia, consisting of involuntary extension and separation of the fingers when the arm is raised. Also known as Finger phenomenon and Souque's phenomenon or sign. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Finger-thumb sign, passive flexion of the metacarpophalangeal joint of one of the fingers causes flexion of the basal joint and extension of the terminal joint of the thumb. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Finsterer's sign, [Hans Finsterer, Austrian surgeon, 1877-1955] a paradoxical slowing of the pulse. A sign seen in severe intraperitoneal hemorrhage. (Finsterer 1923) (*ARPS* 1990) (*Cardiovascular*) (*Gastrointestinal*)

First Nerve sign, clinical test of the olfactory cranial nerve; can the patient smell? (*ARPS* 1990) (*Neurologic*)

Fischer's sign, [Louis Fischer, Austrian-American paediatrician, 1864-1944, Eustace Smith, British physician, 1835-1914] 1. when the manubrium sterni is auscultated with the head tilted back there is high raling caused by pressure on the vena brachiocephalica from the lymphatic glands. A sign of tuberculosis of the bronchial glands in children. Also known as Smith's sign. 2. a certain presystolic murmur. A sign of adherent pericardium. Also known as Fisher's sign. (Smith 1875) (Fischer 1907) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Fish Anemia sign, a rare form of megaloblastic anemia caused from the ingestion of undercooked fish containing the zoonotic *Diphyllobothrium* tapeworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Hematologic*)

Fish Mouth sign, abnormal eyelids and a wide mouth with low set ears. May have hair and genital malformations. Also known as ablepharon macrostomia. (*ARPS* 1990) (*Genetic*) (*Renal Reproductive*) (*Otolaryngology*) (*Oral Maxillofacial*) (*Neurologic*)

Fish Odor sign, metabolic disorder with the inability to properly breakdown trimethylamine causing a person's breath, sweat, and urine to have a strong fishy odor. Also known as trimethylaminuria. (*ARPS* 1990) (*Nutritional*)

Fisherman's sign, a zoonotic skin or systemic cellulitis disease caused by *Erysipelothrix rhusiopathiae*. The bacterium is found in fish, swine, turkeys, marine mammels, and pigeons. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Fish-skin sign, ichthyosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Fish-slime sign, septicemia following a punctured wound made by the spine of a fish. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Fisher's sign, [Louis Fischer, Austrian-American paediatrician, 1864-1944] a certain presystolic murmur. A sign of adherent pericardium. Also known as Fischer's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Fiske-Bryson's sign, [Louise Fiske-Bryson, American physician] with exophthalmic goiter there is diminished chest inspiration. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*) (*Respiratory*) (*Otolaryngology*) (*Ophthalmic*)

Fitz's sign, [Reginald Heber Fitz, American physician, 1843-1913] sudden and severe vomiting, epigastric pain and swelling, associated with acute pancreatitis. (*ARPS* 1990) (*Gastrointestinal*)

Flag sign, dyspigmentation of the hair occurring as a band of light hair, seen in children who have recovered from kwashiorkor. (*IMD* 1974) (*ARPS* 1990) (*Nutritional*) (*Dermatologic*)

Flajani's sign, [Giuseppe Flajani, Italian surgeon, 1741-1808] exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Flax-dresser's sign, a kind of pneumonia seen in flax-dressers, and caused by inhaling particles of flax. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Flexion Reflex of Leg sign, tapping of the tendons of the semimembranosus and semitendinosus muscles causes flexion of the leg. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Flexor sign, paradoxical, dorsiflexion of the great toe or of all the toes when the deep muscles of the calf are pressed upon. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Flint's sign, [Austin Flint, American physiologist, 1812-1886] also known as Flint's murmur. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Cardiovascular*)

Floating Liver sign, the liver forms an abdominal prominence that may be moved about, arising from a lax abdominal wall following repeated pregnancies. (*AACM* 1896) (*ARPS* 1990) (*Gastrointestinal*)

Floating Tooth sign, radiography of the mandible exhibits teeth which appear to be floating because there is no bone around them, this erosion of the alveolar bone is seen in some forms of histiocytosis X. (*ARPS* 1990) (*Oral Maxillofacial*)

Flour Sign, abdominal distress and vomiting caused by the ingestion of flour beetles, which have ingested rat faeces containing the eggs of the zoonotic dwarf *Hymenolepis nana* tapeworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*)

Fluid sign, [Sir Thomas Lewis, English surgeon] when the venous pressure is within normal limits, the external jugular vein is usually not visible. Signs of excess intravenous fluids, myocardial failure, and anoxaemia will cause the external jugular vein to be engorged. This is often the earliest sign of excess intravenous fluids. See Lewis's sign. (*ARPS* 1990) (*Cardiovascular*)

Flush-tank sign, the passage of a large amount of urine and the coincident temporary disappearance of a lumbar swelling. A sign of hydronephrosis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Fly Bite Fever sign, [Americas] fever, muscle pain, severe vesicular stomatitis, with throat and lymph node involvement. Lesions can also appear on the rectum. Caused by the bite of infected flies and mosquitos carrying the zoonotic vesicular stomatitis virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Gastrointestinal*)

Fontanel sign, dorsal flexion of the great toe with a fan-wise spreading of the other toes elicited by continued pressure at the corner of the posterior lateral fontanel; occurs in the presence of disease of the middle ear in children up to the age of five years. Also known as Grünfelder's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*) (*Muscular Skeletal*)

Fontanelle sign, the anterior fontanelle is visibly depressed in cases of pediatric dehydration. (*ARPS* 1990) (*Muscular Skeletal*) (*Nutritional*)

Foot-and-mouth sign, contagious epizootic aphthae. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*) (*Dermatologic*)

Fordyce's sign, [John Addison Fordyce, American dermatologist, 1858-1925] numerous small, faint yellow granules occurring in the buccal mucosa and lip. Also called Fordyce granules and spots. Oral contraceptives have been linked to an increase in incidence. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Renal Reproductive*) (*Dermatologic*)

Forearm sign, [André Léri, French physician, 1875-1930] passive flexion of the hand and wrist of the affected side in hemiplegia shows no normal flexion at the elbow. Also known as Léri's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Forehead sign, smooth forehead due to changes in the center of the frontalis muscle and loss of the eyebrows and eyelashes. An indication of leprosy. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Oral Maxillofacial*) (*Dermatologic*) (*Muscular Skeletal*)

Formication sign, [Jules Tinel, French neurologist, 1879-1952] a tingling sensation in the distal end of a limb when percussion is made over the site of a divided nerve. It indicates a partial lesion or the beginning regeneration of the nerve. Also known as distal tingling on percussion sign, D.T.P. sign, and Tinel's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Fothergill's sign, [John Fothergill, English physician, 1712-1780] 1. facial pain brought on by the gentlest touch. A sign of trigeminal neuralgia. Also called trifacial neuralgia. 2. scarlatina anginosa. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Fountain of Youth sign, [Mexico] the patient's wrinkles have smoothed out and their face has been restored to a youthful appearance. Indicates infection with a diffuse type of leprosy. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*)

Fournier's sign, [Jean Alfred Fournier, French dermatologist, 1832-1914] 1. the sharp delimitation characteristic of a syphilitic skin lesion. 2. saber shin. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Fourth sign, an alleged exanthematous contagious disease resembling rubella, scarlatina, and measles. It is marked by lamellar desquamation of the skin. Also called Duke's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Fourth Nerve sign, clinical test of the trochlear cranial nerve; is there deviation of the eye upwards and outwards or double vision? (*ARPS* 1990) (*Neurologic*)

Foveolar sign, the ophthalmoscopic reflex in the form of a dot caused by the foveola. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Fox's sign, [George Henry Fox, American dermatologist, 1846-1937] ecchymosis of the inguinal ligament due to retroperitoneal haemorrhage. A sign in haemorrhagic pancreatitis. (Fox 1926) (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*)

Francis sign, painful skin lesions, pneumonia, pharyngitis. Infection caused by a zoonotic tularemia disease. Forms of this bacterium are viable biological weapons. Also called deer-fly fever, rabbit fever, and Ohara fever. (*ARPS* 1990) (*Infectious disease Immunology*)

Fränkel's sign, [Albert Fränkel, German physician, 1848-1916] the diminished tonicity of the hip joint muscles. A sign of tabes dorsalis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Infectious disease Immunology*)

Fränkel's Nasal sign, [Bernhard Fränkel, German surgeon, 1836-1911] when pus discharges from one nostril when bending down. A sign of an open empyema antri. (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*)

Frédéricq's sign, [Louis August Frédéricq, Belgian physician, 1815-1853] a red line on the gingiva in tuberculous and certain pulmonary affections. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Respiratory*)

French sign, [Hieronymus Fracastorius, c. 1530] syphilis. Also Called *morbus gallicus* or the French disease. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Frenchify'd' sign, c. 1780, an English term translated as: a person with venereal disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Friedländer's sign, [Carl F. Friedländer, German physician, 1841—] obliterative arteritis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Friedmann's sign, [Max Friedmann, German neurologist] spastic spinal paralysis in infants. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Friedreich's sign, [Nikolaus Friedreich, German physician, 1825-1882] 1. the diastolic collapse of the cervical veins. A sign of adherent pericardium. 2. lowering of the pitch of the percussion note over an area of cavitation during forced inspiration. Also known as Change of Note sign. 3. paramyoclonus multiplex. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Fritos sign, the corn chip or tortilla odor sometimes associated with beta-hemolytic *Streptococcus pyogenes.* (*ARPS* 1990) (*Infectious disease Immunology*)

Frog's Belly sign, the blue-green translucent appearance that a sublingual ranula has. (*ARPS* 1990) (*Oral Maxillofacial*)

Frog's Neck sign, cystic hygroma, the only remarkable translucent swelling of the neck. (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Dermatologic*)

Froment's Paper sign, [Jules Froment, French physician, 1878—] flexion of the distal phalanx of the thumb when a sheet of paper is held between the thumb and index finger; seen in arrections of the ulnar nerve. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Front-tap Reflex sign, a tap on the skin-muscles of the extended leg contracts the gastrocnemius. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Frosted Glass sign, inflamed and thickened eyelids which curl in upon themselves, inverting the eyelashes which begin to scratch the cornea causing a frosted glass appearance and blindness. An indication of infection by zoonotic *Chlamydia trachomatis* transmitted by the fly known as *Musca sorbens*. Also known as Hair in the Eye sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Fuerstner's sign, [C. Fuerstner, German psychiatrist, 1848—] pseudospastic paralysis accompanied by tremor. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Furbringer's sign, [Paul F. Furbringer, German physician, 1849-1930] in cases of subphrenic abscess, the respiratory movements will be transmitted to a needle inserted into the abscess, which is thus distinguished from abscess above the diaphragm. Also called Fuerbringer's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Fusion sign, the reflex which tends to merge the images on the two retinas into a single impression. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Gaenslen's sign, [Frederick Julius Gaenslen, American surgeon, 1877-1937] with the patient on his back on the operating table, the knee and hip of one leg are held in flexed position by the patient, while the other leg, hanging over the edge of the table, is pressed down by the examiner to produce hyperextension of the hip: pain occurs on the affected side in lumbosacral disease. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Gag Reflex sign, a stimulus applied to the pharynx causes swallowing. Also known as Pharyngeal Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Galant's sign, (Johann Susmann Galant, Russian neurologist) cephalo-palpebral reflex. (*ARPS* 1990) (*Muscular Skeletal*)

Galassi's Pupillary sign, Westphal-Piltz phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Galeazzi's sign, [Riccardo Galeazzi, Italian orthopedic surgeon, 1866-1952] in congenital dislocation of the hip, the dislocated side is shorter when both thighs are flexed 90 degrees. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Gall sign, tick fever in cattle, also called anaplasmosis. (*ARPS* 1990) (*Infectious disease Immunology*)

Gambian Horse sign, [Africa] a disease of horses in Senegambia, caused by *Trypanosoma dimorphon* and *congolense.* (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Gambian Plague sign, [Africa] lymphadenopathy associated with smallpox type lesions. Caused by contact with the zoonotic monkeypox virus, that lives in primates, rodents, and Gambian rats. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Gambian Sleeping sign, [Africa] zoonotic trypanosomiasis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Ganges sign, [India] epidemic infection by the cholera bacillus occurring during the Hindu pilgrimage and holy days among the crowds at the lower Ganges in India. (*ARPS* 1990) (*Infectious disease Immunology*)

Gangolphe's sign, [Louis Gangolphe, French surgeon] an appearance of a serosanguineous abdominal effusion. A sign of a strangulated hernia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Gannister sign, pneumokoniosis due to the inhalation of dust by workers in gannister. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Gardner's sign, [Eldon J. Gardener] sebaceous cysts of the skin, polyposis of the large intestine, supernumerary teeth, and osteomas. A sign of Gardner's syndrome. (*ARPS* 1990) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Dermatologic*)

Garel's sign, [Jean Garel, French physician, 1852-1931, Teodor Heryng, Polish surgeon, 1847-1925] on electric trans-illumination of the oral cavity, there is an absence of light perception presenting as an infraorbital shadow on the affected side of the antrum of Highmore. A sign of diseases of the antrum of Highmore, including empyema and tumor. Also known as Burger's sign and Heryng's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Oncology*)

Garland's sign, [George Minott Garland, American physician, 1848—, Louis Hyacinthe Celeste Damoiseau, French physician, 1815-1890, Calvin Ellis, American physician, 1826-1883] the discovery of the peculiar curved line of dulness. A sign of resorption of a pleuritic exudate. Also known as Damoiseau's curve and Ellis's line. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Garlic Breath sign, a chronic condition of extreme pain and grotesque disfigurement caused by poisoning from exposure to white phosphorus. Sufferers have a foul fetid discharge from the jaw with a strong garlic smell. Also known as Phossy jaw sign, the compo, the disease, and the flute. (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Gartner's sign, [Gustav Gartner, Austrian pathologist, 1855-1937] the degree of fulness of the veins of the arm as it is raised to varying heights indicates the degree of pressure in the right atrium. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Gas sign, gas gangrene, enteritis. *Clostridium perfringens*, type A. (*ARPS* 1990) (*Infectious disease Immunology*)

Gastro-colic sign, an increase in intestinal and colonic peristaltic activity following entrance of food into the empty stomach. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Gastroileal sign, an increase in ileal motility and opening of the ileocecal valve when food enters the empty stomach. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Gastropancreatic sign, an increase in pancreatic secretion induced by distention of the corpus of the stomach; it is mediated by the vagus nerve. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Neurologic*)

Gaucher's sign, [Phillippe Charles Ernest Gaucher, French physician, 1854-1918] chronic endothelioma of the spleen. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*)

Gault's Cochleopalpebral sign, contraction of the orbicularis palpebrarum muscle when a sharp, sudden noise is made close to the ear; does not occur in total deafness from labyrinthine disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Gauss's sign, increased mobility of the uterus seen in early pregnancy. (*ARPS* 1990) (*Renal Reproductive*)

Gaussel's sign, [Amans Gaussel, French physician, 1871-1937, Joseph Grasset, French physician, 1849-1918, Charles Franklin Hoover, American physician, 1865-1927] when the patient in a recumbent position attempts to lift the paretic limb, there is greater

downward pressure on the examiner's hand with the sound limb than is observed in the test with a normal person, also described as, in the normal state or in genuine paralysis, if the patient, lying on a couch, is directed to press the leg against the couch, there will be a lifting movement seen in the other leg; this phenomenon is absent in hysteria and malingering. Also known as Bychowski's sign, Complimetary Opposition sign, Grasset's sign, and Hoover's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Gayet's sign, [Prudent Gayet, French surgeon] a rare form of fatal lethargic sleep resembling nelavan. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Death*)

Geigel's sign, [Richard Geigel, German physician, 1859-1930] a reflex in the female corresponding to the cremasteric reflex in the male. On stroking of the inner anterior aspect of the upper thigh there is a contraction of the muscular fibers at the upper edge of Poupart's ligament. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Dermatologic*)

Gengou's sign, [Octave Gengou, French bacteriologist, 1875-1957] fixation of the complement phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Genital sign, any reflex irritability due to disorder of the genital organs. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Geographic Tongue sign, smooth bright red patches on the dorsum of the tongue often with gray, white, or yellow borders. Also known as migratory glossitis. (*ARPS* 1990) (*Oral Maxillofacial*)

Gerhardt's sign, [Anton Biermer, German physician, 1827-1892, Carl Adolf Christian Jacob Gerhardt, German physician, 1833-1902] 1. the absence of laryngeal movement in dyspnea. A sign of aneurysm of the aorta. 2. the change of percussion sound on the change in the position of the patient. A sign of pneumothorax and known as a sign of pulmonary tuberculosis. Also known as the Change of Sound sign and Biermer's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*) (*Infectious disease Immunology*)

Gerlier's sign, [Felix Gerlier, Swiss-French physician, 1840-1914] a disease of the nerve and nerve-centers attacking farm-laborers and stablemen, and characterized by pain, paresis, vertigo, ptosis, and muscular contractions. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Gianelli's sign, unilateral dilatation of the pupil of the abducting eye on extreme lateral fixation. Also known as Tournay's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Gibert's sign, [Camille Melchior Gibert, French physician, 1797-1866] pityriasis rosea. This sign has been listed in past literature also as Gilbert's rosea, due to similar name. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Gifford's sign, [Harold Gifford, American ophthalmologist, 1858-1929] inability to evert the upper lid; seen in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Gifford's Reflex sign, [Harold Gifford, American ophthalmologist, 1858-1929] contraction of the pupil when an effort is made to close the lids which are held apart. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Gifford-Galassi Reflex sign, [Harold Gifford, American ophthalmologist, 1858-1929] contraction of the pupil when an effort is made to close the lids which are held apart. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Giguere's sign, [Michele C. Giguere White, American surgeon] a type of modern malnutrition syndrome caused by artificial milk and infant formula substitutes which are deficient in vitamin D, protein, and essential fats. Presentations include delayed tooth eruption, enamel defects, rickets symptoms, swollen abdomen, as well as, bands of hair discoloration associated with kwashiorkor, and neurologic pathology. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Nutritional*) (*Dermatologic*) (*Gastrointestinal*)

Gilbert's sign, [Nicolas Augustin Gilbert, French physician, 1858-1927] a patient passes more urine while fasting than after a meal. A sign of liver cirrhosis. (Gilbert 1902) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Gastrointestinal*)

Gilchrist's sign, [Thomas Caspar Gilchrist, English-American dermatologist, 1862-1927] blastomycosis, zoonotic fungal pneumonia, dermatologic and bone lesions. Also called blasto and Chicago disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Gilles de la Tourette's sign, [Georges Gilles de la Tourette, French physician, 1857-1904] motor incoordination with echolalia and coprolalia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Giovannini's sign, [Sebastiano Giovannini, Italian dermatologist] nails of the hand are entirely white and opaque, with the look of ivory. A sign found following an attack of typhoid fever. Also called *canities unguium*. (Giovannini) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Giovannini's Hair sign, [Sebastiano Giovannini, Italian dermatologist] a rare nodular disease of the hair produced by a fungus. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Glasier's colic, poisoning from work exposure to lead. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Glasgow's sign, [William Carr Glasgow, American physician, 1845-1907] a systolic sound in the brachial artery. A sign of latent aneurysm of the aorta. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Glass-rod sign, see Aqueous-influx sign and Blood-influx sign. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Ophthalmic*)

Glénard's sign, [Franctz Glénard, French physician, 1848-1920] splanchnoptosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Gluteal sign, a stroke over the skin of the buttock contracts the glutei muscles. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Goggia's sign, in health, the fibrillary contraction produced by striking and then pinching the brachial biceps extends throughout the whole muscle: in debilitating disease, such as typhoid fever, the contraction is local. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Goldblatt's sign, [Harry Goldblatt, American physician, 1891—] ischemic tubular atrophy, a characteristic of renovascular hypertension. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

Goldflam's sign, [S. Goldflam, Polish physician] myasthenia gravis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Goldstein's sign, [Hyman Isaac Goldstein, American physician, 1887-1954, John Langdon Haydon Down, English physician, 1828-1896] wide space of distance between the great toe and the adjoining toe seen in cretinism and Down's syndrome. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Genetic*)

Goldthwait's sign, [Joel Ernest Goldthwait, American orthopedic surgeon, 1866—] the patient lying supine, his leg is raised by the examiner with one hand, the other hand being placed under the patient's lower back; leverage is then applied to the side of the pelvis. If pain is felt by the patient before the lumbar spine is moved, the lesion is a sprain of the sacroiliac joint. If pain does not appear until after the lumbar spine

moves, the lesion is in the sacroiliac or lumbosacral articulation. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Golonbov's sign, tenderness on percussion over the tibia in chlorosis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Hematologic*)

Goodell's sign, [William Goodell, American gynecologist, 1829-1984] if the woman's cervix uteri is soft she is pregnant; if it is hard she is not. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Goose Bumps sign, presence of goose bumps or goose pimples without temperature cause, a sign of hypothalamus disorder. (*ARPS* 1990) (*Dermatologic*) (*Neurologic*)

Gordon's sign, [Alfred Gordon, American neurologist, 1874-1953] finger phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Gordon's Toe sign, [Alfred Gordon, American neurologist, 1874-1953] extension of the great toe on pressure or irritation of the deep flexor muscles of the calf of the leg: indicative of motor tract disturbance. Called also Paradoxic Flexor Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Gorlin's sign, [Robert James Gorlin, American pathologist, 1923-2006] the ability to touch the tip of the nose with the tongue in patients with Ehlers-Danlos syndrome. (Gorlin 1964) (*ARPS* 1990) (*Genetic*) (*Oral Maxillofacial*)

Goth sign, black lips, as if wearing Goth style makeup, with fever and headache. An early sign of septicaemic plague infection. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Gothic Arch sign, an angular deformity of the angulus of the stomach, in which it assumes a Gothic arch shape; a sign of chronic gastric ulcer. Also known as Henning's sign or formation. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Gottron's sign, [Heinrich Adolf Gottron, German dermatologist, 1890-1974] bluish red plaques on the backs of the fingers, especially over the knuckles, seen in dermatomyositis, and sometimes preceding the onset of muscle weakness by weeks or as long as two to three years. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Muscular Skeletal*)

Gould's Bowed Head sign, the bowing of the head in walking to see the ground. A sign of any destructive disease of the peripheral portion of the retina. This tilting of the head allows the image viewed to appear upon the functioning part of the retina. (*TAIMD* 1909) (*ARPS* 1990) (*Ophthalmic*)

Gouraud's sign, [Vincent Ollivier Gouraud, French surgeon, 1772-1848] inguinal hernia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Gourmet Fever sign, in reference to the consumption of pâtés and cheeses like Brie and Chamembert, which can contain zoonotic *Listeria monocytogenes*, causing meningitis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*)

Gowers' sign, [Sir William Richard Gowers, British neurologist, 1845-1915] the abrupt intermittent oscillation of the iris under the influence of light. A sign of certain stages of tabes dorsalis. (Gowers 1895) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*)

Graefe's sign, [Albrecht von Graefe, German ophthalmologist, 1828-1870] the failure of the eye ball to move downward with the upper lid while looking downward. A sign of exophthalmic goiter. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Grancher's sign, [Jacques Joseph Grancher, French physician, 1843-1907] the equality of pitch sounds heard between expiratory and inspiratory murmurs. A sign of obstruction to expiration. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Grancher's Spleen sign, [Jacques Joseph Grancher, French physician, 1843-1907] splenopneumonia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Granger's sign, [Amedee Granger, American radiologist, 1879-1939] if in the radiograph of an infant two years old or less, the anterior wall of the lateral sinus is visible, extensive destruction of the mastoid is indicated. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Grasp sign, a reflex consisting of a grasping motion of the fingers or of the toes in response to stimulation. Also called Grasping Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Muscular Skeletal*)

Grasping sign, a reflex consisting of a grasping motion of the fingers or of the toes in response to stimulation. Also called Grasp Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Muscular Skeletal*)

Grass sign, [Scotland] severe diarrhea and dehydration leading to death in horses. Occurs when horses are put out to graze on the new spring grasses. Also called grass disease. (*ARPS* 1990) (*Death*) (*Infectious disease Immunology*) (*Nutritional*)

Grasset's sign, [Amans Gaussel, French physician, 1871-1937, Joseph Grasset, French physician, 1849-1918, Charles Franklin Hoover, American physician, 1865-1927] when the patient in a recumbent position attempts to lift the paretic limb, there is greater downward pressure on the examiner's hand with the sound limb than is observed in the test with a normal person, also described as, in the normal state or in genuine paralysis, if the patient, lying on a couch, is directed to press the leg against the couch, there will be a lifting movement seen in the other leg; this phenomenon is absent in hysteria and malingering. Also known as Bychowski's sign, Complimentary Opposition sign, Gaussel's sign, and Hoover's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Grave Hand sign, when the hand is seriously inflamed it takes up the position of rest, often associated with grave infections of the hand. (*ARPS* 1990) (*Infectious disease Immunology*)

Graves's sign, [Robert James Graves, Irish physician, 1796-1853] exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Gravidarum Striae sign, white striae on the abdomen which occur in pregnancy. (*ARPS* 1990) (*Dermatologic*) (*Renal Reproductive*)

Green Hair sign, green hair as seen in workers of copper smelters. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Poisoning*)

Greenhow's sign, [Edward Headlam Greenhow, English physician, 1814-1888] 1. parasitic melanoderma; discoloration of the skin in persons of filthy habits, caused by the irritation of lice. 2. a pigmentary process from an itching disease like prurigo and pityriasis stimulating *morbus addisonii*, particularly found in vagrants and tramps. Also called Vagrant's disease and sign. (Greenhow) (Thibierge) (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Endocrine*)

Green Nails sign, *Pseudomonas aeruginosa* growing within the nail bed. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Green Ring sign, a thin green stained band of plaque located on the tooth near the gingiva. With other indicators like dry mouth and tar stained fingers, this sign is associated with heavy smoking of cannabis. (*ARPS* 1990) (*Oral Maxillofacial*)

Green Sickness sign, chlorosis, hypochromic anemia. Also called *morbus virgineus,* virgin's disease or *febris amatoria,* lover's fever. (*ARPS* 1990) (*Hematologic*)

Green Tobacco sign, a form of acute nicotine poisoning caused by the occupational exposure of skin to nicotine while "topping and suckering" the tobacco plants. In the past it was also associated with "priming" tobacco because as the leaves were picked they would be stored for longer periods underneath the arms until the end of the row was reached and then placed on the tobacco carts. However, due to new harvesting equipment that allows the worker to ride and place the primed mature sand lug leaves on a conveyor, this sign is less often related to priming. The sticky, poisonous, alkaloid juice forms a black resin on the arms known as Beaufort Tar (Beaufort County, North Carolina). Also called green tobacco sickness. (*ARPS* 1990) (*Poisoning*)

Green Toy sign, poisoning from possibly acetoarsenate of copper. (*ARPS* 1990) (*Poisoning*)

Greene's sign, [Charles Lyman Greene, American physician, 1862-1929] outward displacement of the free cardiac border by the expiratory movement in pleuritic effusion; it is detected by percussion. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Grey Turner's sign, [George Grey Turner, English surgeon, 1877-1951] discoloration (bruising) of the skin of the loin in acute hemorrhagic pancreatitis. Also known as Turner's sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Hematologic*) (*Gastrointestinal*)

Griesinger's sign, [Wilhelm Griesinger, German neurologist, 1817-1868] an edematous swelling behind the mastoid process. A sign of thrombosis of the transverse sinus. (Griesinger 1842) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Otolaryngology*)

Griesinger's Hookworm sign, [Wilhelm Griesinger, German neurologist, 1817-1868] anemia with dropsy, caused by *ankylostomum duodenale* and general malnutrition; called also *cachexia aquosa.* (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*) (*Nutritional*) (*Infectious disease Immunology*)

Griffith's sign, lower lid lag on upward gaze, a sign of Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Gripes sign, [Thomas Cadwalader, c.1745] West-India Dry-Gripes, lead contamination of rum as a cause of stomach gripes. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Grisolle's sign, [Augustin Grisolle, French physician, 1811-1869] 1. if on stretching an affected portion of erupted skin the papule becomes impalpable to the touch. This is a sign of measles. 2. if on stretching an affected portion of erupted skin the papule can

still be felt. This is a sign of small pox. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Grits sign, a diet of maize leads to the niacin deficiency known as pellagra. To allow for vitamins to be released from the corn for human digestion, the kernels need to be soaked in a lime based solution creating hominy grits. (*ARPS* 1990) (*Nutritional*)

Grocco's sign, [Pietro Grocco, Italian physician, 1856-1916) 1. when there is a triangular area of dulness on the back on the side opposite to that on which the effusion is present. A sign of pleural effusion. Also known as Grocco's Triangle sign and Grocco's Triangular Dulness sign. 2. acute dilatation of the heart produced by muscular effort in the early stages of Graves' disease. 3. extension of the liver dullness to the left of the midspinal line, indicating enlargement of the organ. (Grocco 1905) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*) (*Gastrointestinal*) (*Endocrine*)

Grocco-Frugoni sign, [Pietro Grocco, Italian physician 1856-1916, Cesare Frugoni, Italian physician, 1881-1978] the appearance of numerous pin point bleeding occurring at the elbow during the Rumpel-Leede test. A sign of capillary fragility. (Grocco 1905) (Frugoni 1932) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Hematologic*)

Grossman's sign, [Morris Grossman, American neurologist, 1881—] dilatation of the heart as a sign of pulmonary tuberculosis. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Infectious disease Immunology*)

Gruby's sign, a form of tinea tonsurans seen in children, and due to the fungus *Trichophyton microsporon.* (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Grünfelder's sign, dorsal flexion of the great toe with a fan-wise spreading of the other toes elicited by continued pressure at the corner of the posterior lateral fontanel; occurs in the presence of disease of the middle ear in children up to the age of five years. Also known as Fontanel Reflex sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*) (*Muscular Skeletal*)

Guanarito sign, [South America] fever and bleeding caused by the zoonotic Venezuelan hemorrhagic fever *Arenaviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Hematologic*)

Gubler's sign, [Adolphe Marie Gubler, French physician, 1821-1879] a distinct swelling on the wrist. A sign of lead poisoning. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Poisoning*)

Guillain-Barré sign, [Wilhelm Heinrich Erb, German neurologist, 1840-1921, Georges Charles Guillain, French neurologist, 1876-1961, Jean-Alexandre Barré, French neurologist, 1880-1967] biceps femoris reflex. Also called Erb's Reflex sign. (Erb 1875) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Guilland's sign, brisk flexion at the hip and knee joint when the contralateral quadriceps muscle is pinched; a sign of meningeal irritation. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Guilt sign, abnormally feeling guilty, can progress to feeling paranoid, accompanied with paralysis and fever. An indication of B-12 deficiency caused by a parasitic tapeworm infection. (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Infectious disease Immunology*)

Gulber's sign, swelling on the back of the wrist, indicates lead poisoning. Also called Gulber's tumor. See Gubler's sign. (*TAPMD* 1919) (*ARPS 1990*) (*Poisoning*)

Gull's sign, [Sir William Withey Gull, English physician, 1816-1890] adult cretinoid state in woman. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*)

Gull and Sutton's sign, [Sir William Withey Gull, English physician, 1816-1890, John Bland Sutton, English surgeon] arteriosclerosis. Also called Gull-Sutton disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Gunn's sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] a raising of a ptosed eyelid on opening the mouth and moving the jaw toward the opposite side. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*)

Gunn's Crossing sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] a crossing of an artery over a vein in the fundus of the eye, indicative of essential hypertension. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*)

Gunn's Pupillary sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] with the patient's eyes fixed at a distance and a strong light shining before the intact eye, a crisp bilateral contraction of the pupil is noted. On moving the light to the affected eye, both pupils dilate for a short period. Then on return of the light to the intact eye, both pupils contract promptly and remain contracted. Indicative of minimal damage to the optic nerve. Also known as Marcus Gunn's Pupillary sign and Swinging Flashlight sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Gustolacrimal sign, an anomalous reflex by which food taken into the mouth tends to stimulate the secretion not only of saliva but also of tears. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Oral Maxillofacial*)

Guthrie's sign, [George James Guthrie, English surgeon, 1785-1856] spontaneous disappearance of the testicle. (Guthrie 1832) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*)

Guttmann's sign, [Paul Guttmann, German physician, 1834-1893] a humming sound heard over the thyroid in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*)

Guye's sign, aprosexia in children with adenoids. (*IMD* 1974) (*ARPS* 1990) (*Poisoning*) (*Otolaryngology*) (*Oral Maxillofacial*)

Guyon's sign, [Félix Jean Casimir Guyon, French surgeon, 1831-1920] the ballottement during palpation of the kidney. A sign of a floating kidney. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

H-Reflex sign, a monosynaptic reflex elicited by stimulating a nerve, particularly the tibial nerve, with an electric shock. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Haab's sign, [Otto Haab, Swiss ophthalmologist, 1850-1931] bilateral pupillary contraction when the patient sits in a darkened room and without accommodation or convergence directs his attention to a bright object already within his field of vision. Called also Cerebral Cortex Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Hahn's sign, persistent rotation of the head from side to side during childhood. A sign of cerebellar disease. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Hair Chewing sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] during labour a woman is given hair to chew in belief it makes an easier birth. (*ARPS* 1990) (*Renal Reproductive*) (*Oral Maxillofacial*)

Hair Eaters sign, nodular growth of hair due to fungous spores in association with alopecia furfuracea. Also called tinea nodosa. (Morris and Cheadle) (Crocker) (White 1896) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Hair in the Eye sign, inflamed and thickened eyelids which curl in upon themselves, inverting the eyelashes which begin to scratch the cornea causing a frosted glass appearance and blindness. An indication of infection by zoonotic *Chlamydia trachomatis* transmitted by the fly known as *Musca sorbens*. Also known as Frosted Glass sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Hair-on-End sign, a lateral skull radiograph will show elongated vertical trabeculae. This hair-on-end effect is a sign of Mediterranean anemia. (*ARPS* 1990) (*Hematologic*) (*Muscular Skeletal*)

Hair Pulling sign, a dopamine or serotonin related abnormality that causes a sufferer to pull out ones hair, including bodily hair and eyelashes. (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Halisteresis sign, selective withdrawal of bone salt from already calcified tissue. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Hall's sign, [Marshall Hall, English physician, 1790-1857] a tracheal diastolic shock felt in aneurysm of the aorta. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*) (*Otolaryngology*)

Hall's Head sign, [Marshall Hall, English physician, 1790-1857] spurious hydrocephalus. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Halo sign, a halo effect produced in the roentgenogram of the fetal head between the subcutaneous fat and the cranium; said to be indicative of intrauterine death of the fetus. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Death*)

Halstern's sign, endemic syphilis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Hamburger sign, [Hartog Jacob Hamburger, Dutch physiologist, 1859-1924] chloride shift phenomenon. (*IMD* 1974) (*ARPS* 1990)

Hamman's sign, [Gustov von Bergmann, German internist, 1878-1955, Louis Virgil Hammam, American internist, 1877-1946, René-Théophile-Hyacinthe Laënnec, French physician, 1781-1826] a loud crunching, rasping sound synchronous with the heartbeat. A sign heard in mediastinal emphysema and pneumopericardium. Also known as Bergmann's sign. (Laënnec 1831) (Bergmann 1930) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Hammerschlag's sign, [Albert Hammerschlag, Austrian physician, 1863-1935] abnormal fatigability toward continuous sounds of gradually decreasing intensity phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Hammond's sign, [William Alexander Hammond, American neurologist, 1828-1900, Jean Baptiste Edouard Gelineau, French neurologist, 1859—] mysophobia, a mild form of insanity characterized by a dread of the contact with dirt. (Hammond) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Hammond's Writhing sign, [William Alexander Hammond, American neurologist, 1828-1900] athetosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Hamster Pseudo-mumps sign, fever progressing to meningitis, with testicular and parotid swelling. Caused by exposure to infected urine and faeces of mice, monkeys, dogs, guinea pigs, and hamsters. The virus involved is the zoonotic lymphocytic choriomeningitis arenavirus. Associated with fetal mortality. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Renal Reproductive*) (*Neurologic*) (*Death*)

Hand-and-foot sign, a trophoneurotic affection characterized by ulceration of the hands and feet. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Hanot's sign, [Victor Charles Hanot, French physician, 1844-1896] biliary cirrhosis; hypertrophic cirrhosis of the liver with icterus. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Hantaan sign, rapid fever, kidney failure, severe back pain, and bleeding rash which progresses to death in 15 percent of victims. Caused by a zoonotic hantaviral infectious process known as hemorrhagic fever with renal syndrome. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Renal Reproductive*) (*Dermatologic*) (*Death*)

Harlequin sign, reddening of the lower half of the laterally recumbent body and blanching of the upper half, due temporary vasomotor disturbance in newborn infants. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Harlequin Fetus sign, ichthyosis congenita. (Crocker) (Hallopeau and Elliot) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Harley's sign, [George Harley, English physician, 1829-1896] recurrent hemoglobinuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*)

Harrison's sign, [Edward Harrison, English physician, 1766-1838] a transverse depression located at the xiphisternal junction and mid-axillary lines, over the diaphragm. A sign of rickets. Also called Harrison's sulcus. (*ARPS* 1990) (*Muscular Skeletal*) (*Nutritional*)

Hata sign, [S. Hata, Japanese physician] increase in severity of an infectious disease when a small dose of a chemotherapeutical remedy is given. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Hatchcock's sign, tenderness on running the finger toward the angle of the jaw in mumps. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Haudek's sign, [Martin Haudek, Austrian roentgenologist, 1880-1931] a projecting shadow in radiographs of penetrating gastric ulcer, due to settlement of bismuth in pathologic niches of the stomach wall. Also known as Haudek's niche. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Haverhill sign, rat bite fever with peripheral rash from the zoonotic bacterium S*treptobacillus moniliformis*. Also called epidemic arthritic erythema. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Hawkins' sign, a radiolucent area beneath the head of the talar neck seen on radiography of fractures of the talar neck indicating osteoporosis. (*ARPS* 1990) (*Muscular Skeletal*)

Hayem's sign, [Georges Hayem, French physician, 1841-1933, Eduard Sonnenburg, German surgeon, 1848-1915] sanguineous leucocytosis observed in appendicitis accompanied with periotinitis. Also known as Sonnenburg's sign. (Hayem 1872) (Sonnenburg 1891) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*)

Haygarth's sign, indigenous Australians use a sharp bone to lance their gums and a throw stick is used to knock out a tooth. This is a sign of ceremonial mutilation. (Haygarth) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

Heart Skin sign, contraction of the myocardium which results when the skin of the precordial region is irritated. It is observed with the fluoroscope. Also known as Abrams' Heart Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Cardiovascular*)

Heart Tamponade sign, precordial bulge, the pulse becomes weaker, and the veins of the face and neck become engorged. A sign of haemopericardium. (*ARPS* 1990) (*Cardiovascular*)

Heberden's sign, [Sir William Heberden, English physician, 1710-1801] the presence of nodes on the sides of the distal phalanges of the fingers. A sign of gout. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*)

Heberden's Wasting sign, [Sir William Heberden, English physician, 1710-1801] wasting of the small muscles of the hand as a sign of diabetic neuropathy. (*ARPS* 1990) (*Muscular Skeletal*) (*Endocrine*) (*Neurologic*)

Hecker's sign, [Justus Friedrich Carl Hecker, German pathologist, 1795-1850] speechless from palsy of the tongue, an early indication of the Black Death, due to infection with the Bubonic plaque bacterium *Yersinia pestis*. (Hecker) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Hecht sign, [Adolf Franz Hecht, Austrian paediatrician, 1876—] Rumpel-Leede phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Hectic Tongue sign, a smooth red tongue seen in cases of prolonged suppuration. (*ARPS* 1990) (*Oral Maxillofacial*)

Heel-tap sign, a reflex occurring in disease of the pyramidal tract and consisting of fanning and plantar flexion of the toes produced by tapping the patient's heel. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Hefke-Turner sign, a widening and change in contour of the normal obturator x-ray shadow, indicative of pathologic condition of the hip joint. Also known as Obturator sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Hegar's sign, [Alfred Hegar, German gynecologist, 1830-1914] the softening of the lower segment of the uterus. A sign indicating pregnancy. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Heilbronner's sign, [Karl Heilbronner, Dutch physician, 1869-1914] with cases of organic paralysis there is broadening and flattening of the thigh when the patient lies on their back on a hard surface. This will not occur in cases of hysterical paralysis. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Heim-Kreysig sign, [Ernest Ludwig Hiem, Friedrich Ludwig Kreysig, German physician, 1770-1839] a depression of the intercostal spaces occurring along with the cardiac systole in adherent pericarditis. Also known as Kreysig's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Heine-Medin sign, [O. Medin, Swedish physician] a group of paralysis that differ but are caused by the same infectious agent. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Hektoen's sign, [Ludvig Hektoen, American pathologist, 1863-1951] when antigens are introduced into the animal body in allergic states, there may exist an increased range of new antibody production which may include production of antibodies concerned in previous infections and immunizations. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Helbing's sign, medialward curving of the Achilles tendon as viewed from behind; seen in flatfoot. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Hellat's sign, [Piotr Hellat, Russian otologist, 1857-1912] in mastoid suppuration, a tuning-fork placed on the diseased area is heard for a shorter time than when placed on any other part. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Hellendall's sign, [Hugo Hellendal, German obstetrician, Thomas Stephen Cullen, Canadian gynecologist, 1868-1953] a blueish discoloration of the periumbilical skin. A sign of subcutaneous intraperitoneal haemorrhage, possibly from ruptured ectopic pregnancy or acute pancreatitis. Also known as Cullen's sign. (Cullen 1916) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*) (*Renal Reproductive*)

Hematopoietic sign, disease affecting the blood-making organs. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*)

Hendra sign, [Queensland, Australia] pulmonary infection and encephalitis caused by contact with fruit bats or horses infected with the zoonotic Hendra virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Respiratory*)

Hennebert's sign, [Hennebert, Belgium otologist] in the labyrinthitis of congenital syphilis, compression of the air in the external auditory canal produces a rotatory nystagmus to the diseased side; rarefaction of the air in the canal produces a nystagmus to the opposite side. Also known as Pneumatic sign or test. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Infectious disease Immunology*)

Henning's sign, an angular deformity of the angulus of the stomach, in which it assumes a Gothic arch shape; a sign of chronic gastric ulcer. Also known as Gothic Arch sign or formation. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Henoch's sign, [Edouard Heinrich Henoch, German paediatrician, 1820-1910] Henoch's purpura. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Hepatojugular sign, pressure over the liver causes distention of the jugular vein. It indicates insufficiency of the right heart. Also called Hepatojugular Reflux sign. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Gastrointestinal*)

Heraclius's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] thalassophobia, the fear of the view of immense spaces. Named after Emperor Heraclius, c. 575-641. (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Hering's sign, [Heinrich Ewald Hering, Austrian physician, 1866-1948] a faint murmur heard with the stethoscope over the lower end of the sternum for a short time after death. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Death*)

Hering-Breuer sign, [Heinrich Ewald Hering, Austrian physician, 1866-1948] the nervous mechanism which tends to limit the respiratory excursions. Stimuli from the sensory endings in the lungs and perhaps in other parts passing up the vagi tend to limit both inspiration and expiration in ordinary breathing. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Neurologic*)

Heroin Eyes sign, the characteristic empty hollow stare of a heroin user, as if there is no one behind the eyes. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Hertwig-Magendie sign, [Richard Hertwig, German zoologist, 1850-1937, François Magendie, French physiologist, 1783-1855] skew deviation. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Heryng's sign, [Jean Garel, French physician, 1852-1931, Teodor Heryng, Polish surgeon, 1847-1925] on electric trans-illumination of the oral cavity, there is an absence of light-perception presenting as an infraorbital shadow on the affected side of the antrum of Highmore. A sign of diseases of the antrum of Highmore, including empyema and tumor. Also known as Burger's sign and Garel's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Oncology*)

Hesse-Wartegg sign, [Ernst von Hesse-Wartegg, Austrian researcher, 1851-1918] corpulency for the purpose of female adornment. Refers to the systematic treatment by confinement of the Jewesses of Tunis that were fed the flesh of young puppies until nearly becoming a shapeless mass of fat. (Hesse-Wartegg 1881) (*AACM* 1896) (*ARPS* 1990) (*Nutritional*)

Hetero sign, mucus diarrhea with possible brain and heart involvement. Caused by the ingestion of undercooked fish containing the zoonotic *Heterophyes* fluke, found primarily in the Nile delta region. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Neurologic*) (*Cardiovascular*)

Heubner's sign, [Johann Otto Leonhard Heubner, German paediatrician, 1843-1926] syphilitic endarteritis of the cerebral vessels. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Cardiovascular*) (*Neurologic*)

Hey's sign, [William Hey, English surgeon, 1736-1819] a small hollow felt behind the dislocated mandibular condyle as a sign of unilateral jaw dislocation. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Hicks's sign, [John Braxton Hicks, English gynecologist, 1823-1897] the intermittent contraction of the uterus after the third month of pregnancy. Also known as Braxton-

Hicks's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Hiccup sign, a sign seen occurring in the course of peritonitis. (*ARPS* 1990) (*Gastrointestinal*)

Hide Bound sign, diffuse symmetric scleroderma in which the whole skin is so hard as to suggest a frozen corpse, the face when involved is ghastly and gorgonized. (Crocker) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Higoumenaki's sign, a tumefaction at the inner third of the right clavicle; seen in congenital syphilis. Also known as Clavicular sign. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Hildenbrand's sign, [Johann Valentin Hildenbrand, Viennese physician, 1763-1818] typhus fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Hill's sign, disproportionate femoral systolic hypertension. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Hilton's sign, [John Hilton, English surgeon, 1805-1878] when the forefinger is inflamed it is not flexed as much as the remainder and if a tendon sheath is infected that finger is more flexed than the rest. (*ARPS* 1990) (*Muscular Skeletal*)

Hip-flexion sign, in paraplegia, the phenomenon when the patient attempts to rise from a lying position, he flexes the hip of the paralyzed side. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Hippel's sign, angiogliomatosis in the retina. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*)

Hippocratic Facies sign, [Hippocrates of Cos, Greek physician, c. 460 BC-c. 370 BC] the patient's facies appearance of hollow eyes, collapsed temple, sharp nose, and the ears are cold. As an early sign of post-operative peritonitis. (*ARPS* 1990) (*Gastrointestinal*) (*Ophthalmic*) (*Otolaryngology*)

Hirschberg's sign, adduction, inversion, and slight plantar flexion of the foot on stroking the inner aspect (not the sole) of the foot from the great toe to the heel; called also adductor reflex of foot. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Hirschfeld's sign, acute diabetes mellitus. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*)

Hirschsprung's sign, [Harald Hirschsprung, Danish physician, 1830-1916] congenital hypertrophic dilatation of the colon. Also known as Hirsch'prung's disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Hitzelberger's sign, anesthesia of the facial nerve supplying areas of the external auditory canal. A sign of acoustic neuroma. (ARPS *1990*) (*Neurologic*) (*Otolaryngology*) (*Oral Maxillofacial*)

HIVP sign, a particularly rapid and virulent form of periodontitis, that resembles adult necrotizing ulcerative gingivitis and necrotizing ulcerative periodontitis in immune compromised patients. See ANUG, LGE, and NUP signs. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Hochsinger's sign, [Karl Hochsinger, Austrian paediatrician, 1860—] the presence of excessive indican in the urine during childhood. A sign of *Mycobacteruim tuberculosis*. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*)

Hochsinger's Tetany sign, [Karl Hochsinger, Austrian paediatrician, 1860—] pressure exerted on the inner side of the biceps muscle produces closure of the fist in tetany. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Hodara's sign, [Menahem Hodara, Turkish physician] a kind of trichorrhexis nodosa seen in women in Constantinople. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Hodgkin's sign, [Thomas Hodkin, English physician, 1798-1866] pseudoleukemia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Oncology*)

Hodgson's sign, [Josep Hodgson, English physician, 1788-1869] an aneurysmal dilatation of the proximal part of the aorta, often accompanied by dilatation or hypertrophy of the heart. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Hoehne's sign, [Ottomar Hoehne, German gynecologist, 1871-1932] absence of uterine contractions during delivery despite repeated injections of oxytocics, regarded as a sign of rupture of the uterus. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Hoffman's sign, [Johann Hoffman, German neurologist, 1857-1919, Ernest L. O. Tromner, German neurologist, 1868—] 1. an increased mechanic irritability of the sensory nerves. A sign of tetany. 2. a sudden nipping of the nail of the index, middle,

or ring finger produces flexion of the terminal phalanx of the thumb and of the second and third phalanx of some other finger; called also digital reflex, Hoffmann's reflex, and Tromner's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Holmes' sign, [Gordon Holmes, British neurologist] rebound phenomenon. (Holmes 1911) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Holmes-Stewart sign, [Gordon Holmes, British neurologist] rebound phenomenon. (Holmes 1911) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Homans's sign, [John Homans, American surgeon 1877-1954] with forced dorsiflexion of the foot there is pain behind the knee. A sign of deep vein thrombosis in the calf. (Homans 1934) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Muscular Skeletal*)

Hoof and Mouth sign, fever, vomiting, and painful oral lesions similar to the herpetic type. Caused by contact exposure to cattle and pigs that are infected with the zoonotic Foot-and-Mouth disease aphthovirus. There is high mortality in young animals which can have devastating consequences as it spreads through food supply animals. Humans may be carrier hosts and quarantine recommended. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Dermatologic*) (*Gastrointestinal*)

Hoover's sign, [Amans Gaussel, French physician, 1871-1937, Joseph Grasset, French physician, 1849-1918, Charles Franklin Hoover, American physician, 1865-1927] 1. when the patient in a recumbent position attempts to lift the paretic limb, there is greater downward pressure on the examiner's hand with the sound limb than is observed in the test with a normal person, also described as, in the normal state or in genuine paralysis, if the patient, lying on a couch, is directed to press the leg against the couch, there will be a lifting movement seen in the other leg; this phenomenon is absent in hysteria and malingering. Also known as Bychowski's sign, Complimentary opposition sign, Gaussel's sign, and Grasset's sign. 2. movement of the costal margins toward the midline in inspiration, occurring bilaterally in pulmonary emphysema and unilaterally in conditions causing flattening of the diaphram. such as pleural effusion and pneumothorax. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Respiratory*)

Hope's sign, double heart beat in aortic aneurysm. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Hoppe-Goldflam sign, [Johann Ignaz Hoppe, Swiss physiologist, 1811-1891, S. Goldflam, Polish physician] myasthenia gravis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Horn's sign, [C. ten Horn, Dutch surgeon] pain produced by traction on the right spermatic cord in acute appendicitis. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Gastrointestinal*)

Horner's sign, in the x-ray film of the fetus in utero, overriding of the bones of the vault of the skull indicates death of the fetus. Also known as Spalding's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Death*)

Horse-Hair sign, [Denis Dooley, English physician] the crepitus of surgical emphysema, feels like palpating a horse-hair mattress. Also known as Dooley's sign. (*ARPS* 1990) (*Dermatologic*)

Horsley's sign, [Sir Victor Alexander Haden Horsley, English surgeon, 1857-1916] if there is a difference in the temperature in the two axillae, the higher temperature will be on the paralyzed side. Also called Victor Horsley's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Hottentot Widow sign, a sign of ceremonial mutilation in which if the widow marries a second time she must have the distal joint of her little finger cut off and another joint each time she remarries. (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*)

Housemaid's sign, prepatellar bursitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Houssay's sign, [Bernardo Alberto Houssay, Nobel laureate, Argentinian physiologist, 1887-1971] hypoglycemia and marked increase in sensitiveness to insulin produced by hypophysectomy in depancreatized experimental animals. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Endocrine*)

Howship-Romberg sign, [John Howship, English surgeon, 1781-1841, Moritz Heinrich Romberg, German physician, 1795-1873] shooting pain on the inner side of the thigh as a sign of obturator hernia. (*ARPS* 1990) (*Neurologic*) (*Gastrointestinal*)

Hoyne's sign, a sign elicited in paralytic or non paralytic poliomyelitis: with the patient in the supine position, his head falls back when his shoulders are elevated. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Huayna Coapae sign, [South America] a sign of ceremonial mutilation in which certain Peruvians have three front teeth extracted out in each jaw. (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

Huchard's sign, [Henri Huchard, French physician, 1844-1910] 1. when there is no diminution of the pulse rate after a change from standing to a recumbent posture. A

sign of arterial hypertension. 2. paradoxic percussion resonance in pulmonary edema. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Huebener-Thomsen—Friedenreich sign, [J. O. L. Huebener, Oluf Thomsen, Danish physician, 1878-1940] the *in vivo* or *in vitro* polyagglutinability of red cells by all normal human sera as a result of activation by a bacterial enzyme of a latent T receptor common to all erythrocytes. Called also Thomsen phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Hueter's sign, [Karl Heuter, German surgeon, 1838-1882] the absence of the transmission of osseous vibration. A sign of fracture with fibrous material interposed between the fragments. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Hughes's sign, [Charles Hamilton Hughes, American neurologist, 1839-1916] a reflex in the flaccid penis elicited by pulling upward the foreskin or glans penis, when a sudden downward jerk results. Also known as the Virile Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Huguier's sign, [Pierre Charles Huguier, French surgeon, 1804-1873] fibromyoma uteri. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Human's sign, [J. U. Human, British physician] a sign of the third stage of anesthesia: the chin and larynx move downward during inspiration. Also known as Chin-retraction sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Hunger-evil sign, a form of epilepsy, followed by bulimia in horses. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Hunt's Paradoxical sign, [James Ramsay Hunt, American neurologist, 1872-1937] in dystonia musculorum deformans, if the examiner attempts forcible plantar flexion of the foot that is in dorsal spasm there is produced increase of the dorsal spasm, but if the patient is ordered to extend the foot he will perform plantar flexion. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Hunterian Ulcer sign, [John Hunter, English surgeon, 1728-1793] primary syphilitic chancre, an ulcer with sloping edges which differs from the punched out ulcer in tertiary syphilis. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Huntington's sign, [George Huntington, American physician, 1850-1916] the patient is recumbent, with his legs hanging over the edge of a table, and is told to cough. If the

coughing produces flexion of the thigh and extension of the leg in the paralyzed limb, it indicates that the paralysis is due to an upper motor neuron lesion. Also known as Coughing sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Hupp's sign, [Frank Le Hayne Hupp, American surgeon, 1865-1929] a deep seated hard swelling situated near a joint as a sign of acute osteomyelitis. (*ARPS* 1990) (*Muscular Skeletal*)

Huppert's sign, [Hugo Huppert, French physician, 1832-1904, Otto Kahler, Austrian physician, 1849-1893] a constitutional disease marked by the development of round-celled new growths in the bones, a tendency to spontaneous fractures, enlargement of the spleen and lymphatic glands, and albumosuria. Called also multiple myeloma and myelopatlzic albumosuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Gastrointestinal*) (*Renal Reproductive*) (*Oncology*)

Huschke's sign, Emil Huschke, German anatomist, 1797-1858] tooth-like projections at the free margin of the cochlea labium. Also called auditory teeth. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*)

Hutchinson's sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] interstitial keratitis and a dull red discoloration of the cornea. A sign of inherited syphilis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*)

Hutchinson's Blindness sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913, Warren Tay, English ophthalmologist, 1843-1927] Tay's choroiditis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*)

Hutchinson's Incisors sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] there are depressions or notching of the incisal edges of the labial surfaces of the permanent incisors. A sign of congenital syphilis. Also called Hutchinson's teeth sign and Screwdriver teeth sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Hutchinson's Pupils sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] pupils that are insensitive to light as a sign of cerebral compression. (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Hutchinson's Teeth sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] there are depressions or notching of the incisal edges of the labial surfaces of the permanent incisors. A sign of congenital syphilis. Also called Hutchinson's Incisors sign and Screwdriver teeth sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Hutchinson's Trio sign, [Sir Jonathan Hutchinson, English surgeon, 1828-1913] the presence of interstitial keratitis, notched teeth, and otitis occurring together. A sign of inherited syphilis. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Oral Maxillofacial*)

Huxham's sign, green saliva. (Huxham 1773) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

Hydrocephaloid sign, a condition resembling hydrocephalus, but with depression of the fontanels, due to diarrhea or some other wasting disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Nutritional*) (*Infectious disease Immunology*)

Hydrochloric sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear grayish-white and clothing is stained bright red. A sign of poisoning with hydrochloric acid. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Dermatologic*) (*Poisoning*)

Hydrocyanic sign, giddiness, eyes staring, and teeth clenched. A sign of hydrocyanic acid poisoning. (*ARPS* 1990) (*Oral Maxillofacial*) (*Ophthalmic*) (*Neurologic*) (*Poisoning*)

Hydrophobia sign, even the mention of water brings on painful laryngeal contractions and the patient wants the water removed from sight. Indication of rabies infection by the *Lyssavirus* genus. (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Death*)

Hyperkinesis sign, [Henri Claude, French psychiatrist, 1869-1945] Claude's hyperkinesis. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Hypochondrial sign, sudden inspiration caused by quick pressure beneath the lower border of the ribs. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Hypothenar sign, a reflex elicited by pressure on the pisiform bone. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Icteric Eosinophilic sign, hepatitis with marked eosinophilia due to the ingestion of eggs from the zoonotic *Capillaria hepatica* roundworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Gastrointestinal*)

Idiopathic Disease sign, one not consequent upon any other disease, nor upon any known lesion or injury. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

I1eogastric sign, inhibition of gastric motility by distension of the ileum. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Imposter sign, the individual is convinced that a family member usually their spouse has been replaced by an identical looking imposter. This finding usually follows cerebral stroke or accident damage to the right side of the brain. Also called Capgras syndrome. (*ARPS* 1990) (*Neurologic*)

Inborn sign, a fixed reflex whose mechanism may be supposed to be inherited as its functioning does not depend on previous experience. Also called Unconditioned Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Indirect sign, stimulation upon one side of the body makes a reflex on the other side. Also called Consensual and Crossed reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Infraspinatus sign, obtained by tapping a certain spot over the shoulder-blade, on a line bisecting the angle formed by the spine of the bone and its inner border; outward rotation of the arm occurs, with simultaneous straightening of the elbow. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Inguinal sign, a reflex in the female corresponding to the cremasteric reflex in the male. On stroking of the inner anterior aspect of the upper thigh there is a contraction of the muscular fibers at the upper edge of Poupart's ligament. Also called Geigel's Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Dermatologic*)

Inguino-axillary sign, superficial venous communication between Scarpa's triangle and the axilla, also demonstrated as enlargement of the superficial epigastric and circumflex iliac veins. Indicates thrombosis of the inferior vena cava. (*ARPS* 1990) (*Cardiovascular*)

Inman's sign, [Thomas Inman, English physician, 1820-1876] myalgia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Innocence's sign, [Douglas Moray Cooper Lamb Argyll Robertson, Scottish physician, 1837-1909] in the eastern region of Nigeria natives used the extract of the Calabar bean (*Physostigma venenosum*) which is the seed of a leguminious plant for judicial execution. However, if after ingestion the man vomited it back, then he was considered innocent. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*) (*Nutritional*)

Intercurrent Disease sign, a disease occurring during the course of another disease with which it has no connection. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Interference sign, 1. the interference of one drug with the therapeutic activity of another drug; especially a sort of drug-fastness toward full therapeutic doses of one drug

conferred on a parasite by subtherapeutic doses of another drug. 2. the interference with the replication or virulence of a virus by the simultaneous infection with another that mayor may not be related; called also preemptive immunity or interference phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Interossei sign, [Alexandre Achille Souques, French neurologist, 1860-1944] Souques's phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Interscapular Reflex sign, a stimulus applied between the scapulae contracts the scapular muscles; Called also Scapular reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Interstitial sign, one in which the stroma of an organ is mainly affected. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Intestinal Hernia sign, if a hernia contains intestine, the first part of the sac contents will be difficult to reduce, and the second part will go with ease, and makes a gurgle sound. See Omentum Hernia sign. (*ARPS* 1990) (*Gastrointestinal*)

Intestinointestinal sign, when a part of the intestine becomes overdistended or its mucosa becomes excessively irritated, activity in other parts of the intestine is inhibited as long as the distention persists. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Inverted Radial Reflex sign, a flexion of the fingers without movement of the forearm, produced by tapping the lower end of the radius; it indicates disease of the fifth cervical segment of the spinal cord associated with damage of the pyramidal tract below that level. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Iris Contraction sign, contraction of the pupil on exposure of the retina to light. Also called Pupillary reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Isambert's sign, [Emile Isambert, French physician, 1827-1876] acute miliary tuberculosis of larynx and pharynx. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Otolaryngology*) (*Infectious disease Immunology*)

Ischemic sign, the elevation of arterial pressure in response to cerebral ischemia. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Israel's sign, [Henry H. Branham, American surgeon, James Adolf Israel, German surgeon, 1848-1926, Carl Nicoladoni, Austrian surgeon, 1847-1902] compression of an artery proximal to an arteriovenous fistula causes bradycardia. Also known as Branham's

sign and Nicoladoni's sign. (Nicoladoni 1875) (Israel 1877) (Branham 1890) (*ARPS* 1990) (*Cardiovascular*)

Italian sign, syphilis. Also Called *mal d'Italie*. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

ltard-Cholewa sign, [Jean Marie Gaspard Itard, French otologist, 1774-1838, Erasmus Rudolph Cholewa, German physician, 1845—] anesthesia of the tympanic membrane in otosclerosis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Jaccoud's sign, [Sigismond Jaccoud, Swiss-French physician, 1830-1913] the prominence of the aorta in the suprasternal notch. A sign of leukemia. (Jaccoud 1883) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Hematologic*) (*Oncology*)

Jackson's sign, 1. [Chevalier Q. Jackson, American laryngologist, 1865-1958] asthmatoid wheeze. 2. [James Jackson, Jr., American physician, 1810-1834] prolongation of the expiratory sound over the affected area in pulmonary tuberculosis. 3. a discrepancy between the pulse rate and that of the heart beat. A sign of cardiac failure. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*) (*Cardiovascular*)

Jacquemier's sign, [Jean Marie Jacquemier, French obstetrician, 1806-1876] a blue-purple coloring of the mucous membrane of the vagina. A sign indicating pregnancy. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Jacquemin's sign, a violet coloring of the mucous membrane of the vagina. A sign indicating pregnancy has passed the fourth week. See Jacquemier's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Renal Reproductive*)

Jacquet's sign, [L. Jacquet, French dermatologist] baldness and dental anomalies. Also called Jacquet's reflex alopecia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Jadassohn's sign, [Josep Jadassohn, German dermatologist, 1853—] maculopapular erythrodermia. (*Dermatologic*)

Jadelot's sign, [Jean François Nicalos Jadelot, French physician, 1791-1830] the genal, labial, nasal, and oculozygomatic lines on the faces of young children. A sign thought to indicated specific kinds of disease. Also known as Jadelot's Furrows sign and Jadelot's

Lines sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Jail-Fever sign, typhus fever. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Jake Leg sign, c. 1930 a form of leg paralysis, caused by Jamaican ginger extract adulterated with tri-orthocresyl phosphate. (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Jamaican sign, vomiting, coma, and death from eating the fruit of the *akee* tree. This fruit when unripe contains hypoglycine toxins. (*ARPS* 1990) (*Nutritional*) (*Poisoning*) (*Death*)

James's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] aichmophobia, morbid fear of sharp-pointed instruments, such as knives and swords. Named after James I of England. (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Janeway's sign, [Theodore Caldwell Janeway, American physician, 1872-1917] erythematous lesions on the palm or sole seen in subacute bacterial endocarditis. (*ARPS* 1990) (*Dermatologic*) (*Cardiovascular*) (*Infectious disease Immunology*)

Japanese Fever sign, fever, nausea, encephalitis including seizures and brain damage with paralysis. Caused the bite of a mosquito infected with the zoonotic Japanese encephalitis flavivirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Jaw Reflex sign, 1. closure of the mouth caused by a downward blow on the lower jaw while it hangs passively open. It is seen only rarely in health, but is very noticeable in lesions of the corticospinal tract. 2. clonic contraction of the inferior maxilla and other muscles of mastication, causing jerky motions of the lower jaw on striking the lower jaw with a downward blow while it hangs passively open. It is seen only rarely in health, but is very noticeable in sclerosis of the lateral columns of the cord. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Jaw Jerk Reflex sign, 1. closure of the mouth caused by a downward blow on the lower jaw while it hangs passively open. It is seen only rarely in health, but is very noticeable in lesions of the corticospinal tract. 2. clonic contraction of the inferior maxilla and other muscles of mastication, causing jerky motions of the lower jaw on striking the lower jaw with a downward blow while it hangs passively open. It is seen only rarely in health, but is very noticeable in sclerosis of the lateral columns of the cord. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Jaw-winking sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] Gunn's syndrome, also called Jaw-winking phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Oral Maxillofacial*)

Jellinek's sign, [Stefan Jellinek, Austrian physician, 1871—] the pigmentation, usually brownish, occurring on the lid margins in many cases of hyperparathyroidism. Also known as Rasin's sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Ophthalmic*) (*Endocrine*)

Jendrassik's sign, [Ernst Jendrassik, Hungarian physician, 1858-1921] paralysis of the extraocular muscles in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Joffroy's sign, [Alexis Joffroy, French physician, 1844-1908] when a patient suddenly turns his eyes upward there is an absence of facial contraction. A sign of exophthalmic goiter. (Joffroy 1894) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Joffroy's Paralysis sign, [Alexis Joffroy, French physician, 1844-1908] twitching of the gluteal muscles on pressure against the nates in spastic paralysis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Johnson's sign, alterations of color of the vaginal cervix from violet to pink with alterations of consistence from hard to soft. A sign of early pregnancy. (*TAIMD* 1909) (*ARPS* 1990) (*Renal Reproductive*)

Jolt Accentuation sign, headache from jolt maneuver as a sign of acute bacterial meningitis. (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Jorissenne's sign, the non-acceleration of the pulse on changing from a horizontal to the erect position. A sign of pregnancy. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Cardiovascular*)

Josseraud's sign, a loud metallic sound heard over the pulmonic area. A sign indicating acute pericarditis. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Jourdain's sign, [Anselme Louis Bernard Jourdain, French surgeon, 1734-1816] inflammation with purulent exudate involving the gingiva and alveolar process. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

JP sign, juvenile periodontitis, a disease which is characterized by rapid alveolar bone loss. JP is associated with systemic diseases that affect neutrophil function. These

can include diabetes mellitus, Down syndrome, Chédiak-Hegashi syndrome, cyclic neutropenia, and Job syndrome. (*ARPS* 1990) (*Oral Maxillofacial*) (*Hematologic*) (*Genetic*) (*Infectious disease Immunology*)

Jugular sign, [Hans Heinrich Georg Queckenstedt, German physician, 1876-1918] when the veins in the neck are compressed on one or both sides, there is a rapid rise in the pressure of the cerebrospinal fluid of healthy persons, and this rise quickly disappears when pressure is taken off the neck. But when there is a block in the vertebral canal the pressure of the cerebrospinal fluid is little or not at all affected by this maneuver. Also known as Queckenstedt's sign. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Junin sign, [South America] fever and bleeding caused by the zoonotic Argentinean hemorrhagic fever *Arenaviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Hematologic*)

Jurgensen's sign, a delicate cepitation heard in auscultation of the pleural tubercles. A sign of acute pneumonic phthisis. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Juster sign, extension of the fingers instead of flexion on stimulation of the palm. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Juvenile sign, a glistening white reflection from the smooth surface of the retina in young people. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Juzam sign, elephantiasis graecorum. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Kahler's sign, [Otto Kahler, Austrian physician, 1849-1893] a constitutional disease marked by the development of round-celled new growths in the bones, a tendency to spontaneous fractures, enlargement of the spleen and lymphatic glands, and albumosuria. Called also multiple myeloma and myelopatlzic albumosuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*) (*Gastrointestinal*) (*Renal Reproductive*)

Kanavel's sign, [Allen Buchner Kanavel, American surgeon, 1874-1938] a point of maximum tenderness in the palm one inch proximal to the base of the little finger in infection of tendon sheath. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Kanavel's OEdema sign, [Allen Buchner Kanavel, American surgeon, 1874-1938] oedema gives rise to a soft pitting, but if pus is present, induration will always be palpated. (*ARPS* 1990) (*Infectious disease Immunology*)

Kantor's sign, [John Leonard Kantor, American radiologist, 1890-1947] a thin stringlike shadow in the roentgenogram of the colon through the filling defect; seen in colitis and regional ileitis. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Kaposi's sign, [Moritz Kaposi Kohn, Austrian dermatologist, 1837-1902] xeroderma pigmentosum. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Karplus's sign, a modification of the vocal resonance, in which, on auscultation over a pleural effusion, the vowel "u" spoken by the patient is heard as "a." (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Otolaryngology*)

Kashida's sign, spasm of muscles and hyperesthesia produced by applying heat or cold; seen in tetany. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Katayama sign, anemia with painful enlargement of the spleen and liver caused by the zoonotic microorganism *Schistosoma japonicum*. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Infectious disease Immunology*)

Kayser-Fleischer sign, [Samuel Alexander Kinnier Wilson, British neurologist, 1878-1936, Bernard Kayser, German ophthalmologist, 1869-1954, Bruno Fleischer, German ophthalmologist, 1874-1965] a brown copper containing ring of pigment around grey and blue eyes at the margin of the corneal area as seen in Wilson's disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Ophthalmic*)

Kedani sign, [Japan] an epidemic disease of Japan due to a zoonotic proteus implanted by the bite of a mite (kedani). It is marked by fever, swelling of the lymph-glands, and an exanthematous eruption. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Keen's sign, [William Williams Keen, American surgeon, 1837-1932] an increased diameter of the leg at the malleoli. A sign indicating Pott's fracture of the fibula. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Kehr's sign, [Hans Kehr, German surgeon, 1862-1916] severe pain in the left shoulder in some cases of rupture of the spleen. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Gastrointestinal*) (*Hematologic*)

Kehrer's sign, [Ferdinand Kehrer, German neurologist, 1883—] closure of the eye as a result of tactile or thermal stimulation of the deepest part of the external auditory meatus and tympanum. Also called Kisch's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Kellock's sign, the increase of the vibration of the ribs on sharp percussion with the right hand, while the left hand is being placed firmly on the thorax, under the nipple. A sign of pleural effusion. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Kelly's sign, [Howard Atwood Kelly, American surgeon, 1858-1943] if the ureter is teased with an artery forceps, it will contract like a snake or worm. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Kerandel's sign, [Jean François Kerandel, French physician, 1873-1934] deep hyperesthesia accompanied by pain, often retarded, after some slight blow upon a bony projection of the body; seen in zoonotic African trypanosomiasis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Kergaradec's sign, uterine souffle. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Kernig's sign, [Vladimir Mikhailovich Kernig, German-Russian physician, 1840-1917] 1. occurrence of flexion contracture in the legs or occasionally also in the arms which becomes evident only after the patient sits up, the stiffness of neck and back will ordinarily become much more severe and only now will a flexion contracture occur in the knee and occasionally also in the elbow joints. If one attempts to extend the patient's knees one will succeed only to an angle of approximately 135 degrees. In cases in which the phenomenon is very pronounced the angle may even remain 90 degrees. 2. in the dorsal decubitus the patient can easily and completely extend the leg, however in the sitting posture the leg cannot be completely extended. A sign found in bacterial meningitis. 3. excessive tone of the skeletal muscles, also known as hypertonia. (Kernig 1882) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Kerr's sign, alteration of the texture of the skin below the somatic level in lesions of the spinal cord. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Kestenbaum's sign, a decrease in number of arterioles traversing the optic disk margin as a criterion for optic atrophy. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*)

Kidney Worm sign, renal colic, hematuria, and flank pain, associated with infection from the giant zoonotic roundworm *Dioctophyma renale*. Caused by the ingestion of frog's liver and infected fish. (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*) (*Nutritional*) (*Hematologic*)

Kienböck's sign, [Robert Kienböck, Austrian radiologist, 1871-1953] paradoxical diaphragm contraction: the hemidiaphragm on one side rises on inspiration and falls on expiration. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Killer X sign, [c. 1940, South Eastern United States] a hemorrhagic disease carried by tiny biting gnats commonly called "no-see-ums" or midges that can infect wildlife. Also called blue or black tongue death. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Death*)

Kirmisson's sign, [Edouard Francis Kirmisson, French paediatric surgeon, 1848-1927] transverse striated ecchymoses at the elbow. A sign seen in fractures of the humerus with displacement of the higher fragment. (Kirmisson 1885) (*ARPS* 1990) (*Muscular Skeletal*) (*Dermatologic*)

Kisch's sign, [Bruno Kisch, Austrian physiologist, 1891—] closure of the eye as a result of tactile or thermal stimulation of the deepest part of the external auditory meatus and tympanum. Also called Kehrer's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Otolaryngology*)

Kleist's sign, the fingers of the patient when gently elevated by the fingers of the examiner will hook into the examiner's fingers; indicative of frontal and thalamic lesions. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Klemm's sign, [Paul Klemm, Latvian surgeon, 1861-1921] in the roentgenogram in chronic appendicitis, there is often an indication of tympanites in the right lower quadrant. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Klippel-Feil sign, [Maurice Klippel, French neurologist, 1858-1942, André Feil, French physician, 1884—] flexion and adduction of the thumb when the patient's flexed fingers are quickly extended by the examiner; indicative of pyramidal tract disease. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Knee Jerk sign, the patellar reflex; reflex contraction or clonic spasm of the quadriceps muscle, produced by sharply striking the ligamentum patellae when the leg hangs loosely flexed at right angles. It is seen normally in health, but is absent in locomotor ataxia, multiple neuritis, lesions of the lower portion of the spinal cord, lesions of the anterior gray horns of the cord, meningitis, infantile paralysis, pseudohypertrophic paralysis, atrophic paralysis, diabetes, etc., and is increased in spinal irritability, lesions of the pyramidal tract, cerebral tumors, sclerosis of the brain and cord, etc. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Endocrine*) (*Oncology*)

Knie's sign, unequal dilatation of the pupils in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Knife-grinder's sign, chronic catarrhal bronchitis in knife-grinders. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Koch's sign, [Robert Koch, German bacteriologist, 1843-1910] the sudden collapse of tuberculous animals when a fresh culture of tubercle bacilli is injected within the peritoneum. The exudate that forms contains lymphocytes almost exclusively. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Koch's Phenomenon sign, [Robert Koch, German bacteriologist, 1843-1910] if a guinea pig which has been previously infected with tuberculosis organisms is reinjected intracutaneously, the skin over the injected area undergoes necrosis and a superficial ulcer develops. The ulcer heals quickly and infection of regional lymph nodes is retarded. The phenomenon demonstrates development of ability to localize tubercle bacilli. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Kocher's sign, [Emil Theodor Kocher, Swiss surgeon, 1841-1917, James Ramsay Hunt, American neurologist, 1872-1937] when following the examiner's raising hand, the patient's upper lid springs up more quickly than the eyeball. A sign of Grave's disease. Also known as Ramsay's sign. (Kocher 1874) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Kocher's Testicular sign, [Emil Theodor Kocher, Swiss surgeon, 1841-1917] contraction of the abdominal muscle on compression of the testicle. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Renal Reproductive*)

Koebner's sign, the appearance of isomorphic lesions at the site of an injury in psoriasis, verruca plana, lichen nitidus, or lichen planus; called also isomorphic effect. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Koehler's sign, [Alban Koehler, German radiologist, 1874—] young children with dystrophy of the scaphoid bone. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Kohnstamm's sign, [Oscar Felix Kohnstamm, German physician, 1871-1917] after-movement phenomenon. (*IMD* 1974) (*ARPS* 1990)

Konzo sign, irreversible paralysis of the legs, caused by ingesting cassava, a Nigerian fruit containing the glycoside linamarin. (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Nutritional*)

Kool-Aid sign, reported sweet fruity grape odor of *Pseudomonas aeruginosa*. (*ARPS* 1990) (*Infectious disease Immunology*)

Koplik's sign, [Henry Koplik, American paediatrician, 1858-1927] the appearance of a crop of buccal macules consisting of small dark red spots surrounded by minute white specks. A sign found in the prodromal stage of measles. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Koranyi's sign, [Baron Koranyi, Hungarian physician, 1828-1913] increase of resonance over the dorsal segment on percussion of the spinal processes of the thoracic vertebrae; a sign of pleural effusion. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Korsakoff's sign, [Sergei Sergeyevich Korsakoff, Russian neurologist, 1854-1900] a condition of impaired memory with a tendency to false reminiscence combined with symptoms of multiple neuritis: seen in alcoholics and some cases of gastro-intestinal disease. Also known as Korsakov's psychosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Neurologic*)

Kreysig's sign, [Ernest Ludwig Hiem, Friedrich Ludwig Kreysig, German physician, 1770-1839] a depression of the intercostal spaces occurring along with the cardiac systole in adherent pericarditis. Also known as Hiem-Kreysig's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Krishaber's sign, [Maurice Krishaber, Hungarian physician, 1836-1883] a neuropathy affecting the nerves of sensation and the heart, and marked by tachycardia, vertigo, hyperesthesia, and sense-illusions. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Kriskowsky's sign, the presence of cicatrical lines which radiate from the mouth. A sign of inherited syphilis. Also known as Krisovski's sign and Krisowski's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Krisovski's sign, the presence of cicatrical lines which radiate from the mouth. A sign of inherited syphilis. Also known as Kriskowsky's sign and Krisowski's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Kühne's Muscular sign, [Wilhelm Friedrich Kühne, German physiologist, 1837-1900] the passage of a continuous current through a living muscle fiber causes an undulation proceeding from the positive toward the negative pole. Also known as Kühne's muscular phenomenon and Porret's phenomenon or sign. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*)

Kümmell's sign, [Hermann Kümmell, German surgeon, 1852-1937] a complex of symptoms coming on in a few weeks after spinal injury, and consisting of pain in the

spine, intercostal neuralgia, motor disturbances of the legs, and a gibbosity of the spine, which is painful on pressure and easily reduced by extension; traumatic spondylitis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Kuru sign, [Calton Gajdusek, Michael Alpers] trembling, loss of the ability to walk, talk, and eat. Eventually ending with death. A sign of the fatal brain disease Kuru caused by cannibalism. Kuru means trembling with fear in the Fore language. Also known as Laughing Death sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Nutritional*) (*Death*)

Kussmaul's sign, [Adolph Kussmaul, German physician, 1822-1902] 1. an overfulness of the jugular veins on inspiration. A sign seen in mediastinopericarditis and mediastinal tumor. 2. convulsions and coma in stomach disease as a result of toxin absorption. 3. paradoxical pulse. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Oncology*) (*Gastrointestinal*) (*Poisoning*)

Kussmaul's Paralysis sign, [Adolph Kussmaul, German physician, 1822-1902] poliomyelitis anterior. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Muscular Skeletal*)

Küstner's sign, [Otto Ernst Küstner, German gynecologist, 1850-1931] a cystic tumor on the medial line anterior to the uterus. A sign found in cases of ovarian dermoids. Also known as Kuester's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Renal Reproductive*)

Kyasanur sign, [India] rash, fever, bradycardia, the patient then appears to be getting better and is then attacked by meningoencephalitis. Caused by the bite of a tick infected with the zoonotic Kyasanur forest *Flaviviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Cardiovascular*) (*Neurologic*)

Labordes' sign, [Jean Baptiste Vincent Laborde, French physician, 1830-1903] a clean needle is plunged into the biceps muscle and soon oxidizes. A sign of life. Also known as Cloquet's needle sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Death*)

Lacrimal sign, secretion of tears elicited by touching the conjunctiva over the cornea. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

LaCrosse sign, [Wisconsin, 1963] fever and nausea that can progress in children to include seizures, coma, paralysis, and brain damage, caused by a viral encephalitis. This zoonotic disease is spread by the bite of the mosquito. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Ladin's sign, [Louis Julius Ladin, American gynecologist, 1862—] a sign of pregnancy, consisting in a circular elastic area, which offers a sensation of fluctuation to the examining finger, situated in the median line of the anterior surface of the body of the uterus just above the junction of the body and the cervix. This area increases in size as pregnancy advances. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Laënnec's sign, [René-Théophile-Hyacinthe Laënnec, French physician, 1781-1826] the occurrence of rounded gelatinous masses found in the sputum. A sign of bronchial asthma. Also called Laënnec's pearls. (Laënnec) (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Laënnec's Liver sign, [René-Théophile-Hyacinthe Laënnec, French physician, 1781-1826] alcoholic cirrhosis of the liver. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Lafora's sign, [Gonzalo Rodriguez Lafora, Spanish physician, 1887—] picking of the nose regarded as an early sign of cerebrospinal meningitis. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Infectious disease Immunology*)

Lambing sign, milk fever in ewes. (*ARPS* 1990) (*Infectious disease Immunology*)

Lancet sign, [Karl Rudolphi, Swedish scientist, 1771-1832] dicrocoeliasis from injestion of raw liver or ants containing the zoonotic fluke. (*ARPS* 1990) (*Infectious disease Immunology*)

Landau's sign, when an infant is held in the prone position, the entire body forms a convex upward arc; gentle pressure on the head or gravity flexes the neck and hip, reversing the arc. (*ARPS* 1990) (*IMD* 1974) (*Muscular Skeletal*)

Landou's sign, the inability to grasp the uterus bimanually. A sign that there is the presence of slight ascites. Also called Landau's sign. (*TAIMD* 1909) (*ARPS* 1990) (*Renal Reproductive*)

Landouzy's sign, [Louis Landouszy, French physician, 1845-1917, Adolf Weil, German physician, 1848-1916] severe leptospirosis; also called Weil's sign and Fiedler's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Landry's sign, [Jean Baptiste Octave Landry, French physician, 1826-1865] acute ascending paralysis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Langoria's sign, the relaxation of the extensor muscles of the thigh. A sign of intracapsular fracture of the femur. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Lantern Jaw sign, [Condict Walker Cutler, Jr., American surgeon] acromegaly. (*ARPS* 1990) (*Muscular Skeletal*) (*Oral Maxillofacial*) (*Endocrine*)

Larcher's sign, grayish, cloudy discolorations of the conjunctiva, that are speedily blackened. A sign of death. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Death*)

Larrey's sign, [Baron Dominique Larrey, French surgeon, 1766-1842] 1. A thick set patient raises himself in a wooden armchair and lets himself drop to the seat, causing pain in the affected joint. 2. atrophy and disappearance of the testicle, sometimes both are involved, and the subjects occasionally become mentally deranged. Also known as Egyptian sign. (Larrey) (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Neurologic*)

Laryngeal sign, irritation of the fauces and larynx causes cough. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Respiratory*)

Lasègue's sign, [Ernest Charles Lasègue, French physician, 1816-1883] when flexion of the thigh upon the hip is painless and when the knee is bent such flexion is made easily. A sign in sciatica that distinguishes the case from hip-joint disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Lassa sign, [Africa] severe swelling of the head and neck, with muscle pain and fever, there will also be heart and lung effusions. Caused by the zoonotic Lassa arenavirus spread by rodent waste or human contact. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Respiratory*) (*Cardiovascular*)

Lata sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Laughing sign, paralysis of the lips and tongue, pseudobulbar type. (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Laughing Death sign, [Calton Gajdusek, Michael Alpers] trembling, loss of the ability to walk, talk, and eat. Eventually ending with death. A sign of the fatal brain disease Kuru caused by cannibalism. Kuru means trembling with fear in the Fore language. Also known as Kuru sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Nutritional*)

Laugier's sign, [Stanislas Laugier, French surgeon, 1799-1872] a condition in which the styloid process of the radius and of the ulna are on the same level; seen in fracture of the lower part of the radius. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Leathery Palm sign, a classic sign of arsenical poisoning, in which the palms and the soles of the feet have a leathery texture. Also known as Arsenic sign. (*ARPS* 1990) (*Dermatologic*) (*Poisoning*)

Leber's sign, [Theodor Leber, German ophthalmologist, 1840-1917] hereditary optic atrophy; a congenital malformation of the optic nerve, with palsy and degeneration of the affected parts. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Genetic*)

Le Grand-Geblewics sign, a flickering source of colored light (40-50 per second) when observed indirectly is perceived as a constant white light. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Leg sign, 1. Schlesinger's sign, [Herman Schlesinger, Austrian physician, 1866-1934] in tetany, if the patient's leg is held at the knee joint and flexed strongly at the hip joint, there will follow within a short time an extensor spasm at the knee joint, with extreme supination of the foot. Called also Pool's phenomenon. 2. Neri's sign, 1. a sign of organic hemiplegia, consisting in the spontaneous bending of the knee of the affected side as the leg is passively lifted, the patient being in the dorsal position. 2. with the patient standing, forward bending of the trunk will cause flexion of the knee on the affected side in lumbosacral and iliosacral lesions. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Legal's sign, [Emmo Legal, German physician, 1859-1922] a disease affecting the pharyngotympanic region, and manifested by headache and local inflammatory changes. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Legg's sign, [Arthur T. Legg, American surgeon, 1874—] quiet hip disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Leichtenstern's sign, [Otto Michael Ludwig Leichtenstern, German internist, 1845-1900] percussion on any bone of the extremities causes a sudden tic and sometimes a scream. A sign of cerebrospinal meningitis. (Leichtenstern 1885) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Infectious disease Immunology*)

Leidy's sign, [Joseph Leidy, American palaeontologist, 1823-1891] gastroenteritis followed by severe muscle pains and fever, then progressive facial swelling and

complications including heart and brain involvement. The infection is usually caused by ingesting wild boar, feral pigs, or bear meat, which have viable zoonotic *Trichinella* nematode cysts. Also known as trichinosis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Neurologic*) (*Nutritional*) (*Cardiovascular*)

Leigh's sign, enormous hydrocele in the tunica vaginalis. (Leigh 1697) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*)

Lemon sign, [Thomas Wharton, English surgeon, 1614-1673] 1. enlargement of the submaxillary salivary gland after patient bites into a lemon and tastes the juice. A sign of a stone in Wharton's duct. 2. Scalloping of the fetal frontal bones with the lemon appearance as a sign of the Arnold-Chiari deformity. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Lemon Salt sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear white or brown and stains clothing brown or orange. A sign of poisoning with oxalic acid. Also known as Oxalic sign and Sorrel Salt sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Poisoning*)

Lennhoff's sign, [Rudolf Lennhoff, German physician, 1866-1933] a furrow appearing on deep aspiration below the lowest rib and above the liver. A sign of an echinococcus cyst of the liver. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*)

Lenticulae sign, purpura followed with free flowing bright red sputum, early signs of the Black Death, the infection with the Bubonic plaque bacterium *Yersinia pestis*. Also called vulgar freckels or *lentiggini*. (Hecker) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*) (*Dermatologic*)

Leopard Skin sign, intense itching and a mottling of the epidermis caused by the microfilariae worms from the zoonotic *Onchocera volvulus* parasite. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Léri's sign, [André Léri, French physician, 1875-1930] passive flexion of the hand and wrist of the affected side in hemiplegia shows no normal flexion at the elbow. Also known as Forearm sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Lesieur-Privey sign, [C. Lesieur, French physician, Paul Privey, French physician] tuberculous albumin reaction. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Leser-Trélat sign, [Edmund Leser, German surgeon, 1853-1916, Ulysse Trélat, French physician, 1828-1890] telangiectases, warts, and pigmented spots that appear suddenly and increase rapidly in number, and may indicate abdominal cancer in the elderly. It may take the form of acanthosis nigricans, dermatomyositis, amyloidosis, herpes zoster, or senile keratoses. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Oncology*)

Let-down sign, the ejection or release of milk from the alveoli of the breast into the ducts, caused by a combination of neurogenic and hormonal reflexes involving the hormone oxytocin and to a lesser extent, vasopressin; called also milk ejection and milk-let down reflex. (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Neurologic*)

Leudet's sign, [Theodor Emile Leudet, French physician, 1825-1887] a crackling sound in the ear, audible to the observer caused by tic of the mandibular division of the trigeminal nerve. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Levasseur's sign, the failure of the scarificator and cupping glass to draw blood. A sign of death. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Death*)

Lewis' sign, [Sir Thomas Lewis, English surgeon] 1. when the venous pressure is within normal limits, the external jugular vein is usually not visible. Signs of myocardial failure, anoxaemia, and excess intravenous fluids will cause the external jugular vein to be engorged. See Fluid sign. 2. the phenomenon of hydrophagocytosis. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

LGE sign, linear gingival erythema, an erythematous band at the free gingiva that follows the contour with a reddish chevron appearance. An indication of HIV disease. See ANUG, HIVP, and NUP signs. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Lhermitte's sign, [Jacques Jean Lhermitte, French neurologist, 1877-1959] flexing of the neck causes sudden electric shock like sensations that extend down the spine and spread into the limbs. A sign seen mainly in multiple sclerosis but also in cervical cord compression, tumors, spondylosis, and vitamin B12 deficiency. Also known as Barber Chair sign. (Lhermitte 1924) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Oncology*) (*Nutritional*)

Libman's sign, [Emanuel Libman, American physician, 1872-1946] extreme tenderness, but without pain on pressure, of the tips of the mastoid bones. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Lichtheim's sign, [Ludwig Lichtheim, German physician, 1845-1928] in subcortical aphasia, although the patient cannot speak, he is able to indicate with his fingers the

number of syllables in the word he is thinking of. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Lid sign, irritation of the conjunctiva closes the lids. Called also Corneal and Eyelid-closure reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Liddel and Sherrington Reflex sign, [Sir Charles Scott Sherrington, Nobel laureate, English physiologist, 1857-1952] reflex contraction of a muscle in response to passive longitudinal stretching. Also called Stretch Reflex and Myotatic Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Liesegang's sign, [Ralph Eduard Liesegang, German chemist, 1869-1947] the peculiar periodic formation of a precipitate in concentric banded rings, waves, or spirals, when two electrolytes diffuse into and meet in a colloid gel. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Ligature sign, in hematuria, the development of ecchymoses in the distal part of a limb to which a ligature has been applied. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*) (*Dermatologic*)

Light sign, 1. a luminous image reflected from the membrana tympani. 2. a circular spot of light seen reflected from the retina with the retinoscopic mirror. 3. contraction of the pupil when light falls on the eye. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Limburger sign, strong smell of Limburger cheese, present in wounds, bandages or bed linens. An indication of gangrene infection. (*ARPS* 1990) (*Infectious disease Immunology*)

Linder's sign, with the patient recumbent or sitting with outstretched legs, passive flexion of the head will cause pain in the leg or the lumbar region in sciatica. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Lion Face sign, the leonine facies presentation of leprosy, includes the thickened skin on the ears and nose, as well as, the thickening of the brows, producing the lion appearance. (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*)

Lip sign, a reflex movement of the lips of sleeping babies which occurs on tapping near the angle of the mouth. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Litten's sign, [Moritz Litten, German physician, 1844-1907] a movable horizontal depression on the lower part of the sides of the thorax. A sign seen in respiration. Also

known as Litten's diaphragm phenomenon. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Little's sign, [William John Little, English physician, 1810-1894] the scissors gait of spastic paraplegia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Little Dragons sign, vesicular skin lesion that ruptures to reveal a worm. Caused by the zoonotic *Dracunculus medinensis* nematode. Also known as the Guinea or Medina worm infection. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Livierato's sign, [Panagino Livierato, Italian physician, 1860-1936] 1. contraction of the myocardium which results when the skin of the precordial region is irritated. It is observed with the fluoroscope. Also called Abrams' Heart Reflex sign. 2. vasoconstriction when the abdominal sympathetic nerve is irritated by striking the anterior abdomen along the xiphoumbilical line. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Cardiovascular*)

Living Angel sign, anomalous bronze discoloration of the skin with hairs surrounded by a darker color. The skin in these areas has a colored secretion with the distinct smell of mice and a garlicky odor. (Galtier) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Lloyd's sign, when pressure over the kidney causes no pain, however there is pain in the loin on deep percussion over the kidney. A sign of renal calculus. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Lobstein's sign, [Johann Friedrich Georg Christian Martin Lobstein, German surgeon, 1777-1835] osteopsathyrosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Lockjaw sign, muscle spasms in the jaw followed by tetanic convulsions with arched back, accompanied by raised eyebrows and an evil open grin, called *risus sardonicas*. This is a classic sign of a tetanus infection caused by the anaerobic bacterium *Clostridium tetani*. The normal time between infection and showing the first signs in tetanus is at least five days, whereas strychnine poisoning which has a similar presentation is an acute illness which shows signs ten to twenty minutes after exposure. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Poisoning*) (*Neurologic*) (*Muscular Skeletal*)

Logan Turner sign, [Arthur Logan Turner, Scottish surgeon, 1865-1939] a method of palpating the pharynx and root of the tongue, to confirm the presence of adenoids. (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*)

Lombardi's sign, [Antonio Lombardi, Italian physician] the appearance of venous varicosities in the region of the spinous processes of the seventh cervical and first three thoracic vertebrae; seen in early pulmonary tuberculosis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Cardiovascular*) (*Muscular Skeletal*)

Lonestar sign, a zoonotic *Borrelia* disease in Southern USA, also called Southern tick-associated rash illness. (*ARPS* 1990) (*Infectious disease Immunology*)

Long Scar sign, livid white blotches and scars on the shins and ankles from constant scratching. A sign of onchocerciasis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Lorens's sign, [Adolf Lorenz, Austrian surgeon, 1854-1946] ankylotic rigidity of the spinal column, especially of the lumbar and thoracic segments. A sign of incipient phthisis. Also known as Lorenz's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Lorenz's sign, [Adolf Lorenz, Austrian surgeon, 1854-1946] ankylotic rigidity of the spinal column, especially of the lumbar and thoracic segments. A sign of incipient phthisis. Also known as Lorens's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Louping sign, [United Kingdom] meningoencephalitis caused by the bite of the *Ixodes ricinus* tick that is infected with the zoonotic Louping ill flavivirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Lovén sign, general vasodilatation of an organ when its afferent nerve is stimulated; this secures a maximal supply of blood to the organ, together with a general rise of blood pressure. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Lowy's sign, [Otto Lowy, American pathologist, 1879—] marked dilatation of the pupil on the instillation of adrenalin into the conjunctival sac. A sign of pancreatic insufficiency. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Gastrointestinal*)

Lucas's sign, [Richard Clement Lucas, English physician, 1846-1915] distention of the abdomen. A sign of the early stages of rickets. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Nutritional*) (*Muscular Skeletal*)

Lucas-Championniere's sign, [Just Marie Marcellin Lucas-Championniere, French surgeon, 1843-1913] chronic pseudomembranous bronchitis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Lucatello's sign, [Luigi Lucatello, Italian physician, 1863-1926] the external (axillary) temperature is higher than the oral by 0.2 to 0.3 degrees in hyperthyroid patients. (*IMD* 1974) (*ARPS* 1990) (*Endocrine*)

Lucid Interval sign, the patient rouses from unconsciousness and during the next 24 hours goes unconscious again. A sign of middle meningeal haemorrhage. (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Ludloff's sign, [Karl Ludloff, German surgeon, 1864—] swelling and ecchymosis at the base of Scarpa's triangle together with inability to raise the thigh when in a sitting posture, a sign of traumatic separation of the epiphysis of the greater trochanter. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Ludwig's sign, [Wilhelm Friedrich von Ludwig, German surgeon, 1790-1865] swelling in the submental area, the tongue is displaced upwards and that may cause the inability to close the mouth. Cellulitis of the deep cervical fascia. Also known as Ludwig's Angina. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Lumbar sign, contraction of the back muscles in response to stimulation of the skin along the erector spinae. Also known as Dorsal Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Lusitanus's sign, chromidrosis, perspiration resembling the color of sooty water. (Lusitanus 1637) (Galeazzi) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Lust's sign, tapping on the external popliteal nerve below the fibula head causes abduction with dorsal flexion of the foot. A sign indicating spasmophilia. Also called Lust's reflex. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Lyon's sign, loss of smell, the nose collapses and the head of the patient droops. A sign that flies have deposited their ova in the nasal passages and maggots arise and the larval worms lodging in the cribiform plate of the ethmoid begin feeding on the soft tissues, finally eating away at the bridge of the nose. The eyelids swell closed. Also called *peenash* in Sanskrit. (Lyon 1885) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Ophthalmic*) (*Otolaryngology*)

McBurney's sign, [Charles McBurney, American surgeon, 1845-1913] tenderness at a point midway between the umbilicus and the anterior superior spine of the ilium. A sign seen in appendicitis. Also known as McBurney's point. (McBurney 1889) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

McCarthy's sign, [Daniel J. McCarthy, American neurologist, 1874-1958] contraction of the orbicularis oculi muscle on tapping the supraorbital nerve. (*APMD* 1920)

(*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Ophthalmic*)

McClintock's sign, [Alfred Henry McClintock, Irish physician, 1822-1881] after child birth the mother has a pulse rate exceeding 100 for more than an hour. A sign indicating post-partum hemorrhage. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

McCormac's sign, percussing the patellar tendon produces adduction of the opposite leg. Also called MacCormac's reflex. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

McDougall's Powder sign, [Alexander McDougall, Angus Smith, c. 1854] the presence of a white stain around the mouth and brown stains, known as eschars on the skin of the face. Indicating suicide from the intake of McDougall powder, a sewage deodorant and parasite insecticide made from carbolic acid. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Poisoning*) (*Death*)

McDowall's sign, a decrease in systemic blood pressure following vagotomy, due to abolishment of the afferent impulses from the atria, which normally induce vasoconstriction. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

McGinn-White sign, [Sylvester McGinn, American cardiologist, 1904—, Paul Dudley White, American cardiologist, 1886—] a Q wave and late inversion of the T wave in lead III, low S-T intervals and T waves in lead II, and inverted T waves in chest leads V2 and V3 the electro cardiographic evidence of right ventricular dilatation due to massive pulmonary embolism, plus the clinical signs of acute corpulmonale. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

McMurray's sign, [Thomas Porter McMurray, British surgeon, 1887-1948] occurrence of a cartilage click during maniplilation of the knee; indicative of menisceal injury. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Macewen's sign, [Sir William Macewen, Scottish surgeon, 1848-1924] on percussion of the skull behind the junction of the frontal, temporal, and parietal bones, there is a more resonant note than normal in internal hydrocephalus and cerebral abscess. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Machine Murmur sign, patent ductus arteriosus. (*ARPS* 1990) (*Cardiovascular*)

Machupo sign, [South America] fever and bleeding caused by the zoonotic Bolivian hemorrhagic fever *Arenaviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Hematologic*)

Mackenzie's sign, [Sir James Mackenzie, British physician] X-disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Macleod's sign, [Robert Macleod, Scotch physician, 1795-1852] rheumatoid arthritis with joint effusion. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Madagascar sign, eosinophilia and seizures from the ingestion of infected arthropods containing eggs from the zoonotic *Inermicapsifer* cestoda. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Hematologic*) (*Neurologic*)

Madura Foot sign, chronic fungi caused disease, most common form in the foot, pus contains red, black and yellow granules. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Magendie's sign, [François Magendie, French physiologist, 1783-1855, Richard Hertwig, German zoologist, 1850-1937] skew deviation. Also known as Magendie-Hertwig sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Magendie-Hertwig sign, [François Magendie, French physiologist, 1783-1855, Richard Hertwig, German zoologist, 1850-1937] skew deviation. Also known as Magendie's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Magnan's sign, [Valentin Jacques Joseph Magnan, French psychiatrist, 1835-1916] a frightening illusory sensation of a foreign body under the skin. A sign seen in cases of cocaine addition. (Magnan 1871) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Magnus's sign, light ligation of a finger causes no visible change in its distal portion. A sign of death. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Death*)

Magnus and de Kleijn Neck Reflex sign, extension of both ipsilateral limbs, or one, or part of a limb, and increase of tonus on the side to which the chin is turned when the head is rotated to the side, and flexion with loss of tonus on the side to which occiput points. Essentially it is a sign of *decerebrate rigidity.* (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Maher's sign, paracolpitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Mahler's sign, [Richard A. Mahler, German obstetrician] a steady increase of pulse rate without corresponding elevation of temperature; seen in thrombosis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Mahler's Simplex sign, [Richard A. Mahler, German obstetrician] perivaginitis simplex. See Maher's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Maisonneuve's sign, [Jules Germain François Maisonneuve, French surgeon, 1809-1897] marked hyperextensibility of the hand. A sign associated with Colle's fracture. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Majocchi's sign, [Domenico Majocchi, Italian physician] purpura annularis telangiectodes. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Dermatologic*)

Malassez's sign, [Louis Charles Malassez, French physiologist, 1842-1909] cyst of the testicle. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Malignant Military sign, a term that relates to: that many more British soldiers died from dysentery during the Crimean War (1854-56) and the Boer War (1899-1902) than from enemy action. History reveals disease has proven to be more lethal than the enemy weapons in most military campaigns. (*ARPS* 1990) (*Infectious disease Immunology*)

Malgaigne's sign, [Joseph Francois Malgaigne, French surgeon, 1806-1865] weak abdominal musculature, which predisposes to inguinal hernia. Also called Malgaigne's bulgings. (*ARPS* 1990) (*Gastrointestinal*)

Mandan sign, the missing of the left little finger, a sign of religious or ceremonial mutilation by amputation. (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*)

Mandibular sign, Jaw Reflex sign, 1. closure of the mouth caused by a downward blow on the lower jaw while it hangs passively open. It is seen only rarely in health, but is very noticeable in lesions of the corticospinal tract. 2. clonic contraction of the inferior maxilla and other muscles of mastication, causing jerky motions of the lower jaw on striking the lower jaw with a downward blow while it hangs passively open. It is seen only rarely in health, but is very noticeable in sclerosis of the lateral columns of the cord. Also known as Jaw Reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Mann's sign, [John Dixon Mann, English physician, 1840-1912] 1. in Graves' disease the two eyes appear not to be on the same level. 2. the lessened resistance of the scalp to a constant electric current. A sign seen in certain traumatic neuroses. Also known as Dixon Mann's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Mannaberg's sign, marked second pulmonic sound in abdominal disease. (*TAPMD* 1919) (*ARPS* 1990) (*Respiratory*) (*Gastrointestinal*)

Mannkopf's sign, [Emil Wilhelm Mannkopf, German physician, 1836-1918] there is no increase in the frequency of the pulse on pressure. A sign of simulated pain. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Mao's sign, [China] green teeth and the most extremely foul breath associated with the practice of cleaning the mouth by only rinsing with green tea. (*ARPS* 1990) (*Oral Maxillofacial*)

MAP sign, [Heinrich Albert Johne, German pathologist, 1839-1910] zoonotic *Mycobacterium avium* subspecies *paratuberculosis*. Causes chronic diarrhea, sometimes fatal. The bacterium is found in cattle, sheep, giraffes, wildebeest, antelope, and other ruminants. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Death*)

Maple Syrup sign, infant urine with the sweet smell of maple syrup. A sign of a metabolic disorder affecting amino acids, if untreated will lead to brain damage and death. (*Neurologic*) (*Renal Reproductive*) (*Death*) (*Genetic*)

Maranon's sign, [Gregorio Maranon, Spanish physician, 1888-1960] a vasomotor reaction following stimulation of the skin over the throat; seen in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*) (*Endocrine*) (*Otolaryngology*)

Marburg sign, [Africa] rapid fever, muscle pain, vomiting, maculopapular rash with desquamation, liver involvement and bleeding. Mortality can be 30 percent, caused by the zoonotic Marburg hemorrhagic fever *Filoviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Dermatologic*) (*Hematologic*) (*Death*)

March's sign, exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*) (*Otolaryngology*) (*Ophthalmic*)

Marcus Gunn's Pupillary sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] with the patient's eyes fixed at a distance and a strong light shining before the intact eye, a crisp bilateral contraction of the pupil is noted. On moving the light to the affected eye, both pupils dilate for a short period. Then on return of the light to the

intact eye, both pupils contract promptly and remain contracted. Indicative of minimal damage to the optic nerve. Also known as Swinging Flashlight sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Marfan's sign, [Bernard-Jean Antoine Marfan, French paediatrician, 1858-1942] a red triangle on the tip of a furred or coated tongue. A sign of typhoid fever. (Marfan 1899) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Marie's sign, [Pierre Marie, French physician, 1853-1940] tremor of the body and extremities. A sign in exophthalmic goiter. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Neurologic*) (*Otolaryngology*)

Marie's Disease sign, [Pierre Marie, French physician, 1853-1940] akromegaly. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*)

Marie-Foix sign, [Pierre Marie, French physician, 1853-1940] withdrawal of lower leg on transverse pressure of tarsus or forced flexion of toes, even when the leg is incapable of voluntary movement. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Mariner's sign, a sign of religious mutilation in which Tonga natives cut off a portion of the little finger. (Mariner) (*AACM* 1896) (*ARPS* 1990) (*Muscular Skeletal*)

Marinesco's sign, [Georges Marinesco, Roumanian neurologist, 1863-1938] the presence of lividity, edema and coldness of the hand. A sign of syringomyelia. Also known as Marineseo's Succulent Hand sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Marinesco-Radovlci sign, [Georges Marinesco, Roumanian neurologist, 1863-1938] twitching of the chin produced by stimulating (scratching) the palm. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Death*) (*Oral Maxillofacial*) (*Neurologic*)

Marinesco's Succulent Hand sign, [Georges Marinesco, Roumanian neurologist, 1863-1938] the presence of lividity, edema and coldness of the hand. A sign of syringomyelia. Also known as Marineseo's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Marsh's sign, [Frederick Howard Marsh, English surgeon, 1839-1915] technique for elicitation of fluctuation by testing in two planes. (*ARPS* 1990) (*Dermatologic*)

Marsh's Eye sign, [Sir Henry Marsh, Irish physician, 1790-1860] exophthalmic goiter. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Marshall's sign, [Geoffrey Marshall, British physician] bagginess of the eyelids and bloated facies that give the patient an appearance of a wax doll. A sign of myxoedema. Also known as Wax Doll sign. (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Oral Maxillofacial*)

Marshall Hall's sign, [Marshall Hall, English physician, 1790-1857] infantile cerebral anemia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Muscular Skeletal*)

Masini's sign, marked dorsal extension of the fingers and toes in mentally unstable children. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Mass Reflex sign, a reflex exhibited by the entire area controlled by the portion of the spinal cord which has been injured. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Mathieu's sign, [Albert Mathieu, French physician, 1855-1917] severe leptospirosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Mausoleum sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] thanatophobia, the morbid fear of being buried alive, named from the scratch marks found in tombs from trapped people. Also could be described as fear of death itself. (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Mayer's sign, opposition and adduction of the thumb combined with flexion at the metacarpophalangeal joint and extension at the interphalangeal joint, on downward pressure of the index finger. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Mayo's sign, [William James Mayo, American surgeon, 1861-1939, Charles Horace Mayo, American surgeon,1865-1939] relaxation of the muscles controlling the lower jaw, indicative of profound anesthesia. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Mean's sign, lag of the eyeball on upward gaze in Graves' disease. See Kocher's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Meat Tag sign, tattoos containing clear names and registration numbers on military personnel to be used if needed for post mortem identification. Often located on the ribs. (*ARPS* 1990) (*Dermatologic*) (*Death*)

Mecca sign, c. 1831, cholera epidemics appearing more than 40 times between 1831 and 1912 during the Moslem pilgrimage. The disease was then widely dispersed as

the followers of Muhammad returned home and the term Mecca of disease came into use, meaning: The place where diseases come from. Today in the 21st century, pilgrims to Saudi Arabia are especially at risk of contracting a meningococcal infection which causes fatal meningitis and fatal septicaemia blood poisoning. Vaccination requirements are now in place for the multiple sub groups of the meningococcus bacterium. The modern Mecca sign would now be defined as infections relating to the meningococcus bacterium instead the cholera bacillus. (*ARPS* 1990) (*Hematologic*) (*Neurologic*) (*Infectious disease Immunology*)

Mediterranean Blood sign, expansion of the bones of the skull as seen in Mediterranean anaemia, sickle cell anemia, and other haemoglobinopathies. (*ARPS* 1990) (*Hematologic*) (*Muscular Skeletal*)

Medusa's sign, radiating veins from the umbilicus. A sign of portal venous obstruction. Also known as the Caput Medusae sign. (*ARPS* 1990) (*Cardiovascular*)

Medusa's Fetus sign, lithopedion, a fetus that has turned to stone (petrified or calcified). (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Death*)

Meige's sign, [Henri Meige, French physician, 1866-1940] a form of hereditary edema of the legs. Also called Milroy's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Genetic*)

Meirowsky sign, darkening of existing melanin, perhaps by oxidation, beginning within seconds and complete within minutes to a few hours after exposure to ultraviolet radiation. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Melaena Stool sign, bleeding duodenal ulcer. (*ARPS* 1990) (*Gastrointestinal*)

Melting sign, [E. A. White, American historian-archaeologist] the gingival tissues turn from normal pink to purple-black and appear to melt away, awash in a flow of haemorrhage and the eyes may weep tears of blood. A indication of envenomation by the *Dispholidus typus*—Boomslang viper. Also referred to as the Sahara plague. (White 2009) (*Hematologic*) (*Poisoning*) (*Death*)

Meltzer's sign, [Samuel James Meltzer, American physiologist, 1851-1920] the loss of the normal second sound heard on auscultation of the heart after swallowing. A sign of occlusion or contraction of the lower part of the esophagus. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Menangle sign, [New South Wales, Australia] fever from exposure to infected fruit bats or pigs carrying the zoonotic Menangle virus. (*ARPS* 1990) (*Infectious disease Immunology*)

Mendel's sign, [Valdimir Mikhailovich von Bekhterev, Russian neurologist, 1857-1927, Kurt Mendel, German neurologist, 1874-1946] 1. the patient experiences anesthesia of the popliteal space. A sign of tabes dorsalis. 2. Bekhterev's reflexes: deep, hypogastric, pupil, and nasal. Also known as Mendel-Bekhterev sign. (Bekhterev 1904) (Mendel 1904) (*TAIMD* 1909 as Bechterew's sign) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Mendel-Bekhterev sign, [Valdimir Mikhailovich von Bekhterev, Russian neurologist, 1857-1927, Kurt Mendel, German neurologist, 1874-1946] 1. the patient experiences anesthesia of the popliteal space. A sign of tabes dorsalis. 2. Bekhterev's reflexes: deep, hypogastric, pupil, and nasal. Also known as Mendel's sign. (Bekhterev 1904) (Mendel 1904) (*TAIMD* 1909 as Bechterew's sign) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Mendel-Bekhterev Reflex sign, [Valdimir Mikhailovich von Bekhterev, Russian neurologist, 1857-1927, Kurt Mendel, German neurologist, 1874-1946] percussion of the dorsum of the foot normally causes dorsal flexion of the second to fifth toes; in certain organic nervous conditions it causes plantar flexion of the toes. Called also cuboidodigital reflex, *dorsocuboidal* reflex*, Mendel*-Beckterew reflex, and tarsophalangeal reflex. (Bekhterev 1904) (Mendel 1904) (*TAIMD* 1909 as Bechterew's sign) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Mendel's Dorsal Reflex of Foot sign, [Kurt Mendel, German neurologist, 1874-1946] a reflex elicited by percussing the dorsum of the foot. In normal persons it causes dorsal flexion of the second to fifth toes; in certain organic nervous conditions there is plantar flexion of the toes. (*TAIMD* 1909) (*ARPS* 1990) (*IMD* 1974) (*Neurologic*) (*Muscular Skeletal*)

Ménière's sign, [Prosper Ménière, French physician, 1799-1862] aural or auditory vertigo, caused by an inflammatory process and congestion of the semicircular canals, manifested by pallor, vertigo, and various aural and ocular disturbances. (Ménière 1861) (Gray 1893) (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Meniscus sign, the radioscopic appearance of a crescentic shadow made by the crater of a gastric ulcer: when the convexity of the crescent points outward the ulcer is on the lesser curvature; when the convexity points downward the ulcer is distal to the angular incisure. Also known as Crescent sign. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Mennell's sign, an examining thumb is placed over the posterosuperior spine of the sacrum and then made to slide, first outward and then inward. If on pressure over the former point tenderness is detected, it is due to a sensitive deposit in the structures of the gluteal aspect of the posterosuperior spine. If the tenderness is over the inner point, it is

probable that the superior ligaments of the sacral iliac joint are strained and sensitive. If the tenderness is increased by pressure backward on the anterosuperior aspect of the ilium and decreased by pulling forward the crest from behind, this is positive proof that it is caused by the sensitive ligaments. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Mercury sign, purging stringy mucus and blood, tongue may be white and shriveled, suppression of urine. Indicates poisoning from mercury salts. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Renal Reproductive*) (*Poisoning*)

Merycism sign, human rumination. (Winthier 1812) (Percy and Laurent) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*)

Metal Line sign, a line on the gums nearly identical to the lead line, but is caused by mercury. A sign of treatment for venereal disease. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*) (*Poisoning*)

Metchnikoff's sign, [Elie Metchnikoff, Nobel laureate, Russian zoologist, 1845-1916] in Pfeiffer's phenomenon, if the animals are given an intraperitoneal injection of bouillon or other material, twelve hours before the test, lytic phenomena are replaced by phagocytosis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Meth Mouth sign, the front teeth are often missing or black and broken down, due to the heat and dry mouth associated with smoking methamphetamine. Also known as Crack Teeth sign. (*ARPS* 1990) (*Oral Maxillofacial*)

Meunier's sign, daily loss of weight in measles, following the incubative stage and preceding the eruptive stage. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Mexican Hat sign, a Mexican hat shaped shadow representing the filling defect from a colon polyp or the diverticulum on abdominal radiography. Known also as the Bowler Hat sign. (*ARPS* 1990) (*Gastrointestinal*)

Meyer's sign, formication of the hands and sometimes of the feet, experienced particularly after immersion of the extremities in water; once used to distinguish the eruptive stage of scarlet fever from other eruptions. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Meyer's Throat sign, [Hans Wilhelm Meyer, Danish physician, 1824-1895, George Hermann Meyer, German anatomist, 1815-1892] adenoid vegetations of the pharynx. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Miasmatic sign, one due to malarial poisoning. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Poisoning*)

Mibelli's sign, [Vittorio Mibelli, Italian dermatologist, 1860-1910] porokeratosis with yellow brown patches and red and white dike like borders. Also called keratodermia. (Mibelli) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Michelson-Weiss sign in otitis media associated with tuberculosis of the lungs, the patient is able to hear his own respiratory sounds with his affected ear. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*) (*Respiratory*)

Mickey sign, giddiness, blueness of the face, coldness of extremities and unconsciousness. A sign of chloral hydrate or chloralamide poisoning. (*ARPS* 1990) (*Dermatologic*) (*Neurologic*) (*Poisoning*)

Mikulicz's sign, [Johann von Mikulicz-Radecki, Polish surgeon, 1850-1905] chronic enlargement of the lacrimal and salivary glands, due to replacement of the glandular tissue by lymph-cells: called also *achroacytosis*. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Milian's sign, [Gaston Auguste Milian, French dermatologist, 1871-1945] in subcutaneous inflammation of the head and face, the ears are not involved but in skin diseases they are. Also known as Milian's Ear sign. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Dermatologic*) (*Oral Maxillofacial*)

Military Sweats sign, [after c. 1775, France] unknown lethal infection killing significant numbers of peasants. (*ARPS* 1990) (*Infectious disease Immunology*)

Milk sign, vomiting, constipation, and tremors. An often fatal poisoning from eating or drinking milk products produced from cows or sheep that have been poisoned from tremetol containing plants. Also called milk poisoning, trembles, and snakeroot death. (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*) (*Death*)

Milk Let-down sign, the ejection or release of milk from the alveoli of the breast into the ducts, caused by a combination of neurogenic and hormonal reflexes involving the hormone oxytocin and, to a lesser extent, vasopressin; called also milk ejection and let-down reflex. (*IMD* 1974) (*ARPS* 1990) (*Endocrine*) (*Neurologic*)

Milk Maid sign, vesicles on the hands that become pustular often with lymph node swelling. Exposure to cattle, lions, and tigers that are infected with the zoonotic cowpox virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Milker's Nodules sign, red painless skin nodules caused by exposure to cattle infected with the zoonotic pseudocowpox paravirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Mill's sign, [Charles Karsner Mills, American neurologist, 1845-1931] progressive ascending hemiplegia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Mills-Reincke sign, [Hiram F. Mills, American engineer, J. J. Reincke, German physician] the mortality from all diseases decreases as a result of water purification. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Milroy's sign, [William Forsyth Milroy, American physician, 1855-1942] a form of hereditary edema of the legs. Also called Meige's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Genetic*)

Miner's Elbow sign, effusion into the olecranon bursa. (*ARPS* 1990) (*Muscular Skeletal*)

Minor's sign, [Lazar Salomowitch Minor, Russian neurologist, 1855-1942] a patient's method of rising from a sitting position. A sign of ischias when the patient only uses one leg, while lumbago patients tend to climb with both legs. (Minor 1898) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Mirchamp's sign, when a sapid substance, such as vinegar, is applied to the mucous membrane of the tongue, a painful reflex secretion of saliva in the gland about to be affected is indicative of sialadenitis, e.g., mumps. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Miryachit sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Mitchell's sign, [Silas Weir Mitchell, American neurologist, 1829-1914] erythromelalgia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Mitral sign, disease of the mitral valves. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Möbius's sign, [Paul Julius Möbius, German neurologist, 1853-1907] the inability to keep the eyeballs converged. A sign found in exophthalmic goiter due to insufficiency

of the internal recti muscles. Also known as Moebius's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Moebius's sign, [Paul Julius Möbius, German neurologist, 1853-1907] the inability to keep the eyeballs converged. A sign found in exophthalmic goiter due to insufficiency of the internal recti muscles. Also known as Möbius's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Moeller-Barlow's sign, [Julius Otto Ludwig Moeller, German physician, 1819-1887, Sir Thomas Barlow, English physician, 1845-1945] subperiosteal hematoma in rickets. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Nutritional*)

Moeller's Tongue sign, [Moeller, German surgeon, 1829-1862] chronic lingual papillitis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Mokola Fever sign, [Africa] fatal encephalitis caused by a zoonotic rabies lyssavirus. The disease course does not have the classic rabies signs. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Death*)

Mondonesi's Coma sign, [Filippo Mondonesi, Italian physician] in coma from apoplexy, pressure on the eyeball causes contraction of the facial muscles on the side opposite to the lesion; in coma from toxic causes the reflex occurs on both sides. Called also Bulbomimic Reflex sign and Facial Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Poisoning*) (*Oral Maxillofacial*)

Mongol Spot sign, a birthmark on the lower back of Peruvian children with Asian lineage which later disappears. (*ARPS* 1990) (*Genetic*) (*Dermatologic*)

Mongolism sign, [John Langdon, Haydon Down, English physician, 1828-1896] Down syndrome. (*ARPS* 1990) (*Muscular Skeletal*) (*Genetic*)

Monkey sign, intense vaginal inflammation after the insertion of baboon or monkey urine or other secretions. This is a sign of the very wide spread but extremely secretive African custom of preparing for dry sexual intercourse. This taboo practice once incorrectly thought to be confined to the Sub-Sahara regions is endemic though out the world, despite being linked to the increased spread of sexually transmitted diseases and possible zoonosis. See Mud sign. (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

Monkey Bite sign, vesicular blisters and encephalitis including, seizures and coma. Very high mortality caused by the bites or scratches of Old World monkeys infected

with the zoonotic ceropithecine herpesvirus-simiae type B. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*) (*Death*)

Monkey Pancreatitis sign, acute pancreatitis caused by a tapeworm infection in the biliary tract. The zoonotic infection is usually associated with consumption of raw pork viscera, but can also be found in monkeys. Also called Asian taeniasis disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Monkshood sign, prickling and tingling sensations with giddiness and possible numbness in the mouth. The prickling feeling spreads on to the face and then to the whole body. A sign of aconite or aconitine poisoning. Also known as Aconite sign. (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*) (*Poisoning*)

Monteverde's sign, failure of any response to the subcutaneous injection of ammonia. A sign of death. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Death*)

Moon's sign, [Henry Moon, English surgeon, 1845-1892] domed-topped first molars seen in congenital syphilis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Moon Face sign, [Harvey Williams Cushing, American surgeon, 1869-1939] Cushing's syndrome. (*ARPS* 1990) (*Oral Maxillofacial*) (*Endocrine*)

Morand's sign, [Sauveur François Morand, French surgeon, 1697-1773] paresis of the extremities. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Morel-Kraepelin sign, [Benoit Augustin Morel, Emil Kraepelin, German psychiatrist, 1856—] dementia praecox. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Moreschi's sign, [Carlo Moreschi, Italian pathologist, 1876-1921] fixation of the complement phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Morgagni's sign, [Giovanni Baptiste Morgagni, Italian pathologist, 1682-1771] an affection marked by slow pulse, attacks of vertigo, and epileptoid or apoplectoid seizures, probably due to arteriosclerosis of vertebral and basilar arteries. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Morison's sign, [James Rutherford Morison, British surgeon, 1853-1939] a swelling that appears with all of the characteristics of an aneurysm, but is not an aneurysm, is a sarcoma. (*ARPS* 1990) (*Cardiovascular*) (*Oncology*)

Morley's Peritoneocutaneous sign, when any of the cerebrospinal nerve endings in the peritoneum or subperitoneal tissues are irritated, pain will be referred to the corresponding segmental skin area. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Neurologic*)

Moro's sign, [Ernst Moro, German paediatrician, 1874-1951] on placing an infant on a table and then forcibly striking the table on either side of the child, the arms are suddenly thrown out in an embrace attitude; called also Startle Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Moro's Embrace Reflex sign, [Ernst Moro, German paediatrician, 1874-1951] on placing an infant on a table and then forcibly striking the table on either side of the child, the arms are suddenly thrown out in an embrace attitude; called also Moro's and Startle Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Morphea sign, circumscribed scleroderma presenting in patches and bands. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Morquio's sign, [Louis Morquio, paediatrician in Uruguay, 1867-1935] the patient lying supine resists all attempts to raise the trunk to a sitting posture until the legs are passively flexed; noticed in epidemic poliomyelitis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Morton's sign, [Thomas George Morton, American surgeon, 1853-1903] metatarsalgia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Morvan's sign, [Augustin Marie Morvan, French physician, 1819-1897] syringomyelia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Moschcowitz's sign, [Eli Moschcowitz, American physician, 1879—] hyperemia test for arteriosclerosis. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Mosler's sign, sternal tenderness in acute myeloblastic anemia. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Hematologic*)

Mothball sign, reported odor of *Escherichia coli* on BAP medium. (*ARPS* 1990) (*Infectious disease Immunology*)

Motor Reflex sign, a reflex brought about by stimulation upon the periphery of the motor mechanism. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Moulage sign, a waxy cast appearance of bowel segments, a roentgenographic sign of celiac disease. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Mud sign, the presence of mud in the vagina created from dirt and baboon urine to facilitate dry sex. See Monkey sign. (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

Mulberry sign, [Seeber, 1900] strawberry like polyp mass found on the mucous membrane, sometimes extending in the oral and pharyngeal cavities. Caused by the zoonotic fungus *Rhinosporidium seeberi*, endemic in India. Animals involved are cattle, horses, mules, and birds. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Müller's sign, [Friedrich von Müller, German internist, 1858-1941] systolic pulsations of the uvula accompanied by redness and swelling of the velum palati and tonsils. A sign of aortic insufficiency or regurgitation. (Müller 1889) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Cardiovascular*)

Münchmeyer's sign, ossifying myositis. Also called Muenchmeyer's disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Munson's sign, abnormal bulging of the lower lid when the patient rolls his eyes downward. caused by abnormal curvature of the cornea (keratoconus). (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Murat's sign, in the tuberculous patient there is vibration of the affected side of the chest with a feeling of discomfort when speaking. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Murphy's sign, [John Benjamin Murphy, American surgeon, 1857-1916] the inability of the patient to take a deep inspiration when the physician's fingers are hooked up deep beneath the right costal arch below the hepatic margin. A sign of gall bladder disease. (Murphy 1912) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Gastrointestinal*)

Murray Valley sign, severe encephalitis and brain damage from the bite of the *Culex annulirostris* mosquito infected with the zoonotic Murray Valley encephalitis flavivirus. (*ARPS* 1990) (*Infectious disease Immunology*)

Muscle sign, the tendency of striated muscle to contract in hard lumps upon tapping. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Muscular Reflex sign, a reflex movement due to the stretching of a muscle. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Musset's sign, [Louis Charles Alfred de Musset, French poet, 1810-1857] rhythmic jerking movement of the head. A sign seen in cases of aortic aneurysm and aortic insufficiency. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Mustard sign, burning of the eyes as if suffering from the beginning of acute conjunctivitis, with the appearance of swelling as if the patient's eyes had been damaged in a sandstorm. A sign of exposure to persistent chlorine gas. (*ARPS* 1990) (*Ophthalmic*) (*Poisoning*)

Mya's sign, [Giuseppe Mya, Italian physician, 1857-1911, Harald Hirschsprung, Danish physician, 1830-1916] congenital hypertrophic dilatation of the colon. Also known as Hirschsprung's disease. *(TAIMD 1909) (APMD 1920) (DIMD 1921) (IMD 1974) (ARPS 1990) (Gastrointestinal)*

Myenteric Reflex sign, contraction of the intestine above and relaxation below a portion of the intestine that is irritated or distended. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Myer's sign, numbness and formication of both hands. A sign found in scarlet fever. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Myerson's sign, ready induction of blepharospasm when the frontalis muscle is tapped, a sign of Parkinson's disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*) (*Neurologic*)

Myopic sign, a curved reflection seen with the ophthalmoscope on the fundus of the eye to the nasal side of the disk; believed to be indicative of myopia. Also known as Weiss's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Myotatic sign, reflex contraction of a muscle in response to passive longitudinal stretching; called also Liddel and Sherrington Reflex sign and Stretch Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Nairobi Sheep Fever sign, [Africa] headache, fever, and hemorrhagic rash. Caused by zoonotic nairovirus infected tick bites or contact with infected animals. Also called Crimean-Congo hemorrhagic fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Dermatologic*) (*Neurologic*)

Narsaroff's sign, the difference in rectal temperature before and after a cold bath gradually decreases as cold baths are repeated. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Cardiovascular*)

Nasal sign, irritation of the Schneiderian membrane provokes sneezing. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*) (*Respiratory*)

Nasolabial sign, sudden retroversion of the head, stretching of the back, retroversion of the arms at the shoulder, extension and pronation of the forearms, and extension and adduction of the legs, elicited by a slight vertical sweeping motion touching the tip of the nose; it frequently occurs in healthy infants, and disappears around the fifth month of age. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Nasomental sign, contraction of the mentalis muscle on tapping the side of the nose with a percussion hammer. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Otolaryngology*)

Naunyn's sign, [Bernard Naunyn] deep tenderness found when at the end of a full inspiration, the examiner's fingers are thrust upward beneath the costal arch at the outer limit of the right epigastrium. A sign of cholecystitis. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*) (*Respiratory*)

Neck sign, [Jósef Brudziñski, Polish paediatrician, 1871-1917] flexion of the neck causes flexion in the knees and hips. A sign of meningitis, as well as, subarachnoidal haemorrhages and sometimes encephalitis. Also known as Brudziñski's Neck sign. (Brudziñski 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Neftel's sign, [William Basil Neftel, Russian-American neurologist, 1830-1906] inability to sit, stand, or walk without discomfort and paresthesia of the back and head, all movements being easily executed in the recumbent position. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*)

Negro's sign, [Camillo Negro, Italian neurologist, 1861-1927] cogwheel phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Negro Toes sign, [Amazon Basin and Rio Negro, South America] hair loss, sloughing of the nails, garlic breath odor, pulmonary edema, neurological changes, cirrhosis of the liver, and death. Caused by selenium toxicity. A known source is the consumption of Brazil nuts which have more than 1000 percent of the daily recommended dose of the chemical element. (*ARPS* 1990) (*Dermatologic*) (*Neurologic*) (*Nutritional*) (*Hematologic*) (*Gastrointestinal*) (*Respiratory*) (*Poisoning*) (*Death*)

Neisser-Doering sign, [Ernst Neisser, German physician,—1863, Hans Doering, German physician,—1871] suppression of the normal hemolytic action of human serum due to the presence of some antihemolytic substance; sometimes seen in renal cirrhosis and arteriosclerosis. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*) (*Cardiovascular*)

Neisser-Wechsberg sign, [Max Neisser, German physician, 1869-1938, Friedrich Wechsberg, German physician] complement fixation phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Neopolitan sign, syphilis. Also called *morbus neopolitanus*. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Neri's sign, 1. a sign of organic hemiplegia, consisting in the spontaneous bending of the knee of the affected side as the leg is passively lifted, the patient being in the dorsal position. 2. with the patient standing, forward bending of the trunk will cause flexion of the knee on the affected side in lumbosacral and iliosacral lesions. Also known as Leg sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Neufeld's sign, [Fred Neufeld, German bacteriologist, 1861-1945] the dissolution of pneumococci in a solution of bile salts. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Infectious disease Immunology*)

Neumann's sign, [Isidor Neumann, Austrian dermatologist, 1832-1906] pemphigus vegetans. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

New World Fever sign, muscle pain, fever and pin point bleeding lesions, may have brain involvement. Caused by the zoonotic New World hemorrhagic fever *Arenaviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Niche sign, [Martin Haudek, Austrian roentgenologist, 1880-1931] a projecting shadow in radiographs of penetrating gastric ulcer, due to settlement of bismuth in pathologic niches of the stomach wall. Also known as Haudek's niche and sign. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Nicoladoni's sign, [Henry H. Branham, American surgeon, James Adolf Israel, German surgeon, 1848-1926, Carl Nicoladoni, Austrian surgeon, 1847-1902] compression of an artery proximal to an arteriovenous fistula causes bradycardia. Also known as Branham's sign and Israel's sign. (Nicoladoni 1875) (Israel 1877) (Branham 1890) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Nightcliff sign, hepatitis, pulmonary lesions, abscesses. A zoonotic melioidosis disease, carried by rats, horses, primates, other ruminants, zoo animals, and kangaroos. Also

called pseudoglanders, Whitmore disease, and Nightcliff gardener's disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Nightshade sign, severe dry mouth, loss of voice, dilatation of the pupils, suppression of urine, sight and hearing hallucinations. A sign of atropine poisoning. Also known as Atropine and Belladonna sign. (*ARPS* 1990) (*Poisoning*) (*Neurologic*) (*Renal Reproductive*) (*Otolaryngology*) (*Ophthalmic*) (*Oral Maxillofacial*)

Nikolsky's sign, [Petr Vasilyevich Nikolsky, Russian dermatologist, 1858-1940] easy separation of the outer portion of the epidermis from the basal layer on exertion of firm sliding pressure by the finger or thumb, as in pemphigus vulgaris and some other bullous diseases. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Ninth Nerve sign, clinical test of the glossopharyngeal cranial nerve; does the patient have a gag reflex? (*ARPS* 1990) (*Neurologic*)

Nipah sign, [Malaysia] fever, vomiting and encephalitis with high mortality. Caused by contact with pigs, dogs, and fruit bats infected with the zoonotic Nipah vrus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Neurologic*) (*Death*)

Nitric sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear bright yellow and stains clothing yellow or brown. A sign of nitric acid poisoning. (*ARPS* 1990) (*Poisoning*) (*Dermatologic*) (*Gastrointestinal*) (*Oral Maxillofacial*)

Nitrobenzol sign, extreme blueness of face, lips, and finger-tips, breath and urine have odor of bitter almonds. Indicates poisoning from nitrobenzol. (*ARPS* 1990) (*Poisoning*) (*Dermatologic*) (*Oral Maxillofacial*) (*Renal Reproductive*)

Nociceptive sign, reflexes initiated by painful stimuli. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Nostril sign, reduction of the size of the opening of the naris, said to occur on the affected side in pulmonary disease. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Respiratory*)

Nothnagel's sign, [Carl Wilhelm Hermann Nothnagel, German physician, 1841-1905] paralysis of the facial muscles, especially in respect of movements connected with the emotions. A sign observed in cases of tumor of the thalamus. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*) (*Oncology*)

NUP sign, necrotizing ulcerative periodontitis, periodontitis is an inflammatory process of the periodontium which can be aggressive, rapid, and painful in destroying the ligaments

and bone. Systemic diseases associated with periodontitis include, agranulocytosis and infantile genetic agranulocytosis, diabetes, Papillon-Lefèvre syndrome, Chédiak-Higashi syndrome, Type IV and VIII Ehlers-Danlos syndrome, leukocyte adhesion deficiency syndromes, acquired, cyclic, and familial neutropenia, Crohn's disease, hypophosphatasia, Down syndrome, vitamin C deficiency, leukemia, glycogen storage disease, histiocytosis, hypogammaglobulinemia, lazy leukocyte syndrome, and HIV. See ANUG, HIVP, and LGE signs. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*) (*Hematologic*) (*Nutritional*) (*Oncology*)

Nux Vomica sign, feeling of suffocation, tetanic convulsions with arched back and blueness of the face, accompanied by raised eyebrows and an evil open grin, called *risus sardonicas*. A sign indicating poisoning with strychnine. This presentation is similar to signs of a tetanus infection caused by the anaerobic bacterium *Clostridium tetani*, an important differential is the time between infection and showing the first signs in tetanus is at least five days, whereas strychnine poisoning shows signs ten to twenty minutes after exposure. Also known as Strychnine sign after the evergreen tree it is derived from named *Strychnos nux vomica.* (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Poisoning*) (*Neurologic*) (*Muscular Skeletal*)

Ober's sign, [Frank Roberts Ober, American orthopedic surgeon, 1881—] Ober's test for contraction of the tensor fasciae femoris and the fascia lata. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Objective sign, one that can be seen, heard, or felt by the diagnostician. Also known as Physical sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990)

Obliquus Reflex sign, stimulation of the skin below Poupart's ligament contracts a part of the external oblique muscle. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Obstetrician's Hand sign, [Armand Trousseau, French physician, 1801-1867] muscular spasm on pressure over large detached arteries or nerves. A sign seen in tetany and rickets. When tetany is present a contraction of the hand known as "obstetrician's hand" is seen. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Nutritional*)

Obturator sign, a widening and change in contour of the normal obturator x-ray shadow, indicative of pathologic condition of the hip joint. Also known as Hefke-Turner sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Occulta Hair sign, the tuft of hair found over a spina bifida. (*ARPS* 1990) (*Muscular Skeletal*) (*Dermatologic*) (*Neurologic*)

Oculocardiac Reflex sign, a slowing of the rhythm of the heart following compression of the eyes or pressure on the carotid sinus. A slowing of from 5 to 13 beats per minute is normal; one of from 13 to 50 or more is exaggerated; one of from 1 to 5 is diminished. If ocular compression produces acceleration of the heart, the reflex is called *inverted.* Also known as Aschner's phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*) (*Ophthalmic*)

Oculocephalogyric sign, the reflex by which the movements of the eye, the head, and the body are directed in the interest of visual attention. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Oculopharyngeal sign, rapid deglutition together with spontaneous closing of the eyes. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Gastrointestinal*) (*Ophthalmic*)

Oculopupillary sign, stimulation of the cornea or of the eyelid results in dilatation of the ipsilateral and the contralateral pupil. Also known as Oculosensory Cell Reflex sign and Trigeminus Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Oculosensory Cell Reflex sign, stimulation of the cornea or of the eyelid results in dilatation of the ipsilateral and the contralateral pupil. Also known as Oculopupillary Reflex sign and Trigeminus Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Oculovagal sign, pressure on the eyeball induces atrioventricular beats or rhythm. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*) (*Ophthalmic*)

Ogle's sign, decrease in the sense of smell as leukoderma spreads. Also called anosmia. (Ogle 1870) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Otolaryngology*)

Oil Fever sign, fever and encephalitis caused by the mosquito-borne zoonotic *Bunyaviridae* viral Tahyna fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Olean sign, steatorrhea associated with Olestra. (*ARPS* 1990) (*Nutritional*) (*Gastrointestinal*)

Oliver's sign, [William Silver Oliver, English physician, 1836-1908, Antonio Cardarelli, Italian physician] tracheal tugging. A sign of aneurysm of the aorta. Also known as Porter's sign. (Oliver 1878) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Otolaryngology*)

Oliver-Cardarelli sign, [William Silver Oliver, English physician, 1836-1908, Antonio Cardarelli, Italian physician] tracheal tugging. A sign of aneurysm of the aorta. Also

known as Oliver's sign and Porter's sign. (Oliver 1878) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Otolaryngology*)

Ollier's sign, [Léopold Louis Xavier Edouard Ollier, French surgeon, 1830-1901] achondroplasia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Omentum sign, if the hernia sac contains omentum, it will palpate doughy, and the first part of the sac contents will reduce easily and the second part with difficulty due to the adhesions. See also Intestinal Hernia sign. (*ARPS* 1990) (*Gastrointestinal*)

Omsk sign, [Russia] flu symptoms, then encephalitis including deafness. Caused by the tick-borne zoonotic Omsk hemorrhagic fever virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*) (*Otolaryngology*)

Onanoff's sign, [Jaques Onanoff, French physician, 1859—] contraction reflex of the bulbocavernosus and ischiocavernosus muscles on compression of the glans penis seen in dementia praecox. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Neurologic*)

Opalescent sign, violet colored teeth that have an opalescent iridescence. A sign of dentinogenesis imperfecta. This sign when found in a patient with blue sclerae indicates the presence of osteogenesis imperfecta. Also known as brittle bone disease. (*ARPS* 1990) (*Genetic*) (*Muscular Skeletal*) (*Oral Maxillofacial*)

Operculum sign, acute inflammation of the gingival tissue partially covering an incompletely erupted tooth. Often involves trismus and severe pain. Operculum is Latin for little lid as it correctly describes the flap of tissue. Also known as acute pericoronitis. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Ophthalmoscopic sign, as death approaches, the blood in the retinal vessels gradually ceases to move and the column of blood splits into fragments. Also known as Salisbury and Melvin's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Death*)

Oppenheim's sign, [Hermann Oppenheim, German neurologist, 1858-1919] 1. contraction of the tibialis anticus, extensor hallucis, longus extensor digitorum communis, and sometimes of the peroneal muscles on stroking the median surface of the leg at the posterior margin of the tibia from above downward. A sign seen in spastic conditions of the lower extremities. 2. dorsiflexion of the big toe on stroking downward the medial side of the tibia; seen in pyramidal tract disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Oppolzer's sign, during palpation the seat of the apex beat changes with the posture of the patient. A sign of serofibrinous pericarditis. (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*)

Opticofacial Winking sign, closure of the lids when an object is brought suddenly into the field of vision. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Orange-peel sign, a sign for distinguishing lipoma: on compressing the tumor between the thumb and forefinger, it will be perceived that the skin overlying the mass is irregularly dimpled by the downward traction of the vertical trabeculae. Also used to determine breast inflammation. Called also *signe de peau d'orange*. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Oncology*)

Orbeli sign, [Leon Algarovich Orbeli, Russian physiologist, 1882-1958] when the response of a nerve-muscle preparation is diminishing because of fatigue, stimulation of the sympathetic nerve increases the height of the contractions. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Orbicularis sign, in hemiplegia, inability to close the eye on the paralyzed side without closing the other. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Orbicularis Reflex sign, contraction of the pupil associated with closure or attempted closure of the eye. Also called Westphal's Pupillary Reflex sign and Westphal-Piltz Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Orf sign, ulcerated papules on the hands, caused by exposure to sheep and goats that are infected with the zoonotic parapox virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Oriental Eyeworm sign, [Railliet and Henry, 1910] conjunctivitis caused by the zoonotic *Thelazia* roundworm infecting the orbital cavities and associated tissues. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Orthocardiac sign, [Panagino Livierato, Italian physician, 1860-1936] vasoconstriction when the abdominal sympathetic nerve is irritated by striking the anterior abdomen along the xiphoumbilical line. Also known as Livierato's test. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Ortolani Click sign, the palpable click in the hip associated with developmental dysplasia. (*ARPS* 1990) (*Muscular Skeletal*)

Osler's sign, [Sir Wiliam Osler, Canadian physician, 1849-1919] small, painful, erythematous swellings in the skin of the hands and feet in malignant endocarditis.

Also known as Osler's nodes. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Muscular Skeletal*) (*Cardiovascular*)

Osler's Phenomenon sign, [Sir Wiliam Osler, Canadian physician, 1849-1919] agglutination of the platelets of blood directly after it is withdrawn from the circulation. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Osler's Spleen sign, [Sir Wiliam Osler, Canadian physician, 1849-1919] chronic cyanosis with enlarged spleen and polycythemia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Gastrointestinal*)

Ouch-Ouch sign, chills, muscle aches, the loss of the ability to smell, headache, fever, skeletal damage, with respiratory and renal failure. Indications of cadmium poisoning. Can be associated with mining, industrial wastes, fertilizers, smoking cigarettes, and smoking marijuana that has been grow in soils containing high levels of the soft toxic metal. Known as the cadmium blues and in Japan as the *itai-itai* disease. (*ARPS* 1990) (*Otolaryngology*) (*Renal Reproductive*) (*Respiratory*) (*Oncology*) (*Muscular Skeletal*) (*Poisoning*)

Ovens' sign, [Gerald Hugh Campbell Ovens, British surgeon] the patient holds head forwards and upward, and speaks as if his mouth is full. Also makes painful swallowing motions, has some jaw trismus and pain in the back of the throat. A sign of peritonsillar abscess. (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Infectious disease Immunology*)

Oxalic sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear white or brown and stains clothing brown or orange. A sign of poisoning with oxalic acid. Also known as Lemon Salt sign and Sorrel Salt sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Poisoning*)

Oyster Blister sign, bullous skin lesions, severe diarrhea and dehydration, with high mortality rate. Caused by the zoonotic vibriosis diseases contained in raw oysters, mussels, crabs, and shrimp. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Gastrointestinal*) (*Death*)

Paget's sign, [Sir James Paget, English surgeon, 1814-1899] an increase in the size of the skull, which leads to prominence of the forehead, there is also a increase in the thickness of the vault. Marked enlargement of the maxilla is also a classic presentation of the disease. These are signs of Paget's disease of bone, also known as *osteitis deformans*. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Paget's Eczema sign, [Sir James Paget, English surgeon, 1814-1899] eczema of the areola as a sign preceding cancer of the breast. Also known as Eczema sign. (Paget 1874) (*ARPS* 1990) (*Dermatologic*) (*Oncology*)

Palatal sign, stimulation of the palate causes swallowing. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Palatine Duct sign, marked midline swelling in the region of the palatine papilla, as caused by a nasopalatine duct cyst. (*ARPS* 1990) (*Oral Maxillofacial*)

Palatine Reflex sign, stimulation of the palate causes swallowing. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Palmar Reflex sign, tickling the palm flexes the fingers. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Palm-chin sign, twitching of the chin produced by stimulating (scratching) the palm. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Palmomental Reflex sign, twitching of the chin produced by stimulating (scratching) the palm. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Pancoast's sign, [Henry Khunrath Pancoast, American radiologist, 1875-1939] arm and shoulder pain caused by carcinoma of the apex of the lung involving the brachial plexus. (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*) (*Respiratory*)

Painter's sign, [c. 1700's] a form of colic, *colica pictorum*, caused by inhalation of toxic artist pigments, ie. lead chromate, antimony, and red mercury sulfide. French soldiers during the 1760's were employed to grind colours for painters and were often suffering from Painter's colic, thus it has also been called soldier's colic. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Palmoplantar's sign, the yellow discoloration of prominent parts of the palms and soles. A sign of typhoid fever. Also known as Filipovitch's sign and Palmoplantar phenomenon. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Palmus sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Paradoxic Flexor sign, extension of the great toe on pressure or irritation of the deep flexor muscles of the calf of the leg: indicative of motor tract disturbance. Called also Gordon's Reflex sign. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Paradoxical Diaphragm sign, one hemidiaphragm moves upward on inspiration and downward on expiration, opposite to the movements on the contralateral side; seen in phrenic nerve paralysis and eventration. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Paradoxical Pupil sign, Westphal-Piltz phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Paradoxical sign of Dystonia, in *dystonia musculorum deformans*, if the examiner attempts forcible plantar flexion of the foot that is in dorsal spasm there is produced increase of the dorsal spasm, but if the patient is ordered to extend the foot he will perform plantar flexion. Also called Hunt's paradoxical phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Paragglutination sign, a form of nonspecific agglutination of erythrocytes caused by certain blood sera. It disappears at 37 degrees C. and is often due to bacterial contamination of the serum. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Paraserum Reflex sign, group agglutination; paragglutination. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Parasitic sign, one caused by vegetal or animal parasites. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Parenchymatous sign, a disease which attacks the parenchyma of an organ. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Paris Green sign, severe spreading stomach pain with possibly vomiting black from soot or blue from indigo. Intense thirst, cramps, and coma. Also known as Arsenic sign (acute) and Sheep Dip sign. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Parkinson's sign, [James Parkinson, English physician, 1755-1824] an immobile mask like expression. A sign in *paralysis agitans*. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Parrot's sign, [Jules Marie Parrot, French physician, 1839-1883] 1. dilation of the pupil in pinching the skin of the neck. A sign seen in meningitis. 2. bony nodes on the outer table of the skull of infants. A sign of inherited syphilis. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Neurologic*) (*Muscular Skeletal*)

Parrot Fever sign, pneumonia and sepsis, that can mimic typhoid fever, caused by zoonotic psittacosis. The culprit bacterium *Chlamydophila psittaci* can be found in parrots, pigeons, parakeets, as well some domestic poultry, ruminants, and opossums. (*ARPS* 1990) (*Infectious disease Immunology*)

Parrot's Paralysis sign, [Jules Marie Parrot, French physician, 1839-1883] syphilitic pseudoparalysis. (*Infectious disease Immunology*) (*Neurologic*) (*Muscular Skeletal*)

Parry's sign, [Caleb Hillier Parry, English physician, 1755-1822] exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Parsons' sign, [James Parsons, English physician, 1705-1770] exophthalmic goiter. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Partridge's sign, the penis drops off, after first drying up and turning black. A complication of typhus fever. (Partridge) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*)

Pascal's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] agoraphobia, the dread of an open space, sometimes called kenophobia. Named after Blaise Pascal, 1623-1662. (Suckling 1890) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Pastia's sign, [C. Pastia, Romanian physician] hemorrhagic lines appearing in body creases, as in the antecubital fossae. inguinal areas, and the wrists, during scarlet fever; they are visible at the onset of the rash and persist after its desquamation. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Dermatologic*) (*Infectious disease Immunology*)

Patellar Paradoxic sign, a stroke on the patellar tendon, the patient lying on his back, contracts the adductor muscles, while forcible flexion and sudden relaxation of the leg contract the anterior muscles. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Patellar Reflex sign, the knee-jerk reflex; reflex contraction or clonic spasm of the quadriceps muscle, produced by sharply striking the ligamentum patellae when the

leg hangs loosely flexed at right angles. It is seen normally in health, but is absent in locomotor ataxia, multiple neuritis, lesions of the lower portion of the spinal cord, lesions of the anterior gray horns of the cord, meningitis, infantile paralysis, pseudohypertrophic paralysis, atrophic paralysis, diabetes, etc., and is increased in spinal irritability, lesions of the pyramidal tract, cerebral tumors, sclerosis of the brain and cord, etc. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*) (*Endocrine*) (*Oncology*) (*Muscular Skeletal*)

Patelloadductor sign, crossed adduction of the thigh produced by tapping the quadriceps tendon as in the patellar reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Patent Bronchus sign, the radiologic finding of an unobstructed bronchus supplying a collapsed lung, lobe, or segment. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Pathologic Reflex sign, one which is not normal, but is the result of a pathologic condition, and may serve as a sign of disease. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Patrick's sign, [Hugh Talbot Patrick, American neurologist, 1860-1938] Patrick's test movements of flexion, abduction, external rotation, and extension. A sign indicating arthritis of the hip. Also known as Fabere sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Paul's sign, [Constatin Charles Théodore Paul, French physician, 1833-1896] feebleness of the apex beat with forcible impulse over the rest of the heart. A sign indicating pericardial adhesions. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Paullini's sign, chromidrosis, perspiration with a leek-green color. (Paullini 1706) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Pauzat's sign, [Jean Eugene Pauzat, French physician] metatarsal osteoplastic periostitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Pavy's sign, [Frederick William Pavy, English physician, 1829-1911] recurrent albuminuria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Paxton's sign, tinea nodosa or trichorrhexis nodosa. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Pearl-workers' sign, recurrent inflammation of bone with hypertrophy, seen in persons who work in pearl-dust. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Pectoral Reflex sign, the subject's arm is placed half way between adduction and abduction and the examiner's finger in the muscle tendon near the humerus: a sharp blow of the finger elicits adduction and slight internal rotation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Pende's sign, [Nicola Pende, Italian physician, 1880—, André Antoine Henri Thomas, French physician, 1867-1963] during the finger to nose test, the patient is directed to raise his arm over his head and then ordered to let it drop to his head, if the arm rebounds, this is a sign of disease of the cerebellum. Also known as André Thomas sign. (Thomas 1900) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Penile Reflex sign, the bulbocavernous reflex; a tap on the dorsum of the penis retracts the bulbocavernous portion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Penis Reflex sign, the bulbocavernous reflex; a tap on the dorsum of the penis retracts the bulbocavernous portion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Perception Reflex sign, a reflex movement occurring when a perception is formed in consciousness. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Perez's sign, [Jorje Perez, Spanish physician,—1920] a friction sound heard over the sternum when the patient raises and drops his arms. A sign of mediastinal tumor or of aneurysm of the arch of the aorta. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Oncology*)

Perianal sign, contraction of the anal sphincter on irritation of the skin of the anus. Also known as Anal Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Dermatologic*) (*Gastrointestinal*)

Periodic sign, disease which recurs at regular intervals or at the same period in every year. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Periosteal Spinal sign, a tap on the bones of the leg or forearm causes muscular contraction. It occurs in disease of the lateral column of the spinal cord. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Peritoneointestinal sign, inhibition of motility of the stomach and intestine resulting from retroperitoneal irritation or hemorrhage. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Peroneal sign, dorsal flexion and abduction of the foot, a sign of latent tetany elicited by tapping the peroneal nerve just below the head of the fibula, while the knee is relaxed and slightly flexed. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Peroneal Reflex sign, a stroke on the tense peroneal muscles or when the foot is turned in causes reflex movements. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Perpetual Pill sign, metal shot made from antimony found in faeces. Used and reused by one person or passed on to other family members to stimulate vomiting and diarrhoea. Some pills have been reused for many generations. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Perry's sign, overdose of vitamin A often leading to death, caused by the consumption of polar bear liver, which can contain lethal concentrations of vitamin A. This condition which can present with findings of vision changes, headache, and altered consciousness includes the signs for pseudotumor cerebri. (*ARPS* 1990) (*Nutritional*) (*Poisoning*) (*Death*)

Perthes' sign, [Georg Perthes, German surgeon, 1869—] deforming juvenile osteochondritis of the hip. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Peruvian sign, a sign of a religious or ceremonial depilatory custom, in which the eyelashes and eyebrows are pulled out. At times Japenese woman at marriage have pulled out their eyebrows as well and blackened their teeth. (*AACM* 1896) (*ARPS* 1990) (*Ophthalmic*) (*Oral Maxillofacial*)

Pettigrew's sign, paternal hereditary ichthyosis, morbid development of the papillae and thickening of the epidermic lamellae. Also called Armadillo sign. (Pettigrew 1832) (Ascanius) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Peutz-Jeghers sign, [Johannes Laurentius Augustinus Peutz, Dutch physician, 1886-1957, Harold Joseph Jeghers, American physician, 1904-1990] melanin pigmentation as spots around the lips associated with the intestinal polyps of Peutz-Jeghers syndrome. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Gastrointestinal*)

Pfeiffer's sign, [Richard Friedrich Johann Pfeiffer, Prussian bacteriologist, 1858-1945] *cholera vibrios*, introduced into the peritoneal cavity of a guinea pig that has been immunized against cholera, lose their motility and disintegrate. The disintegration can be followed under the microscope by removing a portion of the peritoneal contents from time to time. The same result is observed if a bacteriolytic serum (against cholera) is introduced along with the bacteria into the peritoneal cavity of a normal guinea pig. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Pfeiffer's Fever sign, [Emil Pfeiffer, German physician, 1846-1921] a rare disease marked by elevation of temperature lasting for a short time and by rapid enlargement of lymph-nodes in the neck. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Pfuhl's sign, [Adam Pfuhl, German physician, 1842-1905] inspiration increases the force of flow in paracentesis in the case of subphrenic abscess, but lessens it in the case of pyopneumothorax. This distinction is lost when the diaphragm is paralyzed. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*) (*Neurologic*)

Pfuhl-Jaffe's sign, [Adam Pfuhl, German physician, 1842-1905] liquid issues from exploratory puncture or incision of the plural cavity with considerable force during inspiration. A sign seen in pyopneumothorax. However, when liquid issues from a punture or incision with considerable force during expiration. This is a sign of true pneumothorax. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Pharyngeal sign, a stimulus applied to the pharynx causes swallowing. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Otolaryngology*)

Phasic Reflex sign, an active and coordinated movement occurring as a response to stimulation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Phenol sign, lips and mouth stained white, urine is green-black, breath and urine have carbolic acid smell. Indicates phenol poisoning. (*ARPS* 1990) (*Oral Maxillofacial*) (*Renal Reproductive*) (*Poisoning*)

Phi sign, the perception of the sequential flashing of a stationary row of lights as a moving light. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Philippinic Protein Loss sign, malabsorption and enteropathy caused by the ingestion of fish infected with zoonotic *Capillaria philippinensis* roundworms. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Philippson's sign, excitation of the knee extensor in one leg induced by inhibition in the knee extensor of the other leg. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Phillips' sign, [James Phillips, English surgeon] facial surgical emphysema with crepitus as a sign of traumatic fracture to part of the wall of the corresponding nasal fossa. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Phocas's sign, [B. G. Phocas, French physician, Paul Jules Tillaux, French surgeon, 1834-1904] the presence of a resonant area between the pubic bone and a tumor is indicative of a tumor being mesenteric. (Tillaux) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*)

Phosgene sign, the nose and ear have a purplish tip, and the patient may smell like old hay that has become heated up. A sign of exposure to non-persistent phosgene gas. (*ARPS* 1990) (*Otolaryngology*) (*Poisoning*)

Phosphoric sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. White stains on the mucous membranes. A sign of poisoning with phosphoric acid. (*ARPS* 1990) (*Otolaryngology*) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Poisoning*)

Phosphorus sign, garlic taste, swelling of the tongue, vomiting bilious green, black, and pure blood with repeated fainting. An indication of acute phosphorus poisoning. (*ARPS* 1990) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Poisoning*)

Phossy Jaw sign, a chronic condition of extreme pain and grotesque disfigurement caused by poisoning from exposure to white phosphorus. Sufferers have a foul fetid discharge from the jaw with a strong garlic smell. Also known as Garlic Breath sign, the disease, the compo, and the flute. (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Phrenic sign, rhythmic spasm of the left half of the diaphragm. A sign seen in tetanus. Also known as Phrenic and Diaphragm phenomenon. (*TAIMD* 1909) (*ARPS* 1990) (*Respiratory*) (*Neurologic*)

Physical sign, one that can be seen, heard, or felt by the diagnostician. Also known as Objective sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990)

Physical Shift sign, the shift phenomenon associated with the anterior cruciate ligament. (*ARPS* 1990) (*Muscular Skeletal*)

Pigeon Nest sign, meningitis associated with zoonotic cyptococcosis from exposure to pigeon nests. (*ARPS* 1990) (*Infectious disease Immunology*)

Pill Rolling sign, [James Parkinson, English physician, 1755-1824] tremors of Parkinson's disease. (*ARPS* 1990) (*Neurologic*)

Pilomotor Skin sign, the production of goose flesh on stroking the skin; trichographism. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Piltz's sign, [Jan Piltz, Polish neurologist, 1870-1930, Alexander Karl Otto Westphal, Austrian neurologist, 1863-1941] 1. attention reflex of pupil. 2. Westphal-Piltz phenomenon or sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Piltz's Reflex sign, [Jan Piltz, Polish neurologist, 1870-1930] attention reflex of pupil. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Pimply sign, *fievre boutonneuse*, a zoonotic *Rickettsia* bacterium African tick typhus. Principle animals are dogs and rodents. (*ARPS* 1990) (*Infectious disease Immunology*)

Pinard's sign, [Adolphe Pinard, French obstetrician, 1844-1934] a sharp pain on pressure over the fundus uteri after the sixth month of pregnancy. A sign of breech presentation. (*TAIMD* 1909) (*ARPS* 1990) (*Renal Reproductive*)

Pin Point Pupils sign, small pupils seen in narcotic drug addiction or tabes dorsalis. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Infectious disease Immunology*)

Pins's sign, [Emil Pins, Austrian internist, 1845-1913] the disappearance of the symptoms that simulate pleurisy when the patient is placed in the knee chest position. A sign seen in pericarditis. (Pins 1889) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Piotrowski's sign, [Alexander Piotrowski, German neurologist, 1878—] percussion of the anterior tibialis muscle produces dorsal flexion and supination of the foot. When this reflex is excessive it indicates organic disease of the central nervous system. Called also Anticus sign or reflex. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Pipe Smokers sign, nicotinic stomatitis. (*ARPS* 1990) (*Oral Maxillofacial*)

Piskacek's sign, [Ludwig Piskacek, Hungarian obstetrician, 1854-1933] asymmetrical enlargement of the corpus uteri, a sign of pregnancy. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Pitres's sign, [Jean Albert Pitres, French physician, 1848-1927] 1. hyperesthesia of the scrotum and testes. A sign of tabes dorsalis. 2. anterior deviation of the sternum. A sign of pleuritic effusion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*) (*Respiratory*) (*Muscular Skeletal*)

Pitted Nails sign, psoriasis affecting the nail matrix. (*ARPS* 1990) (*Dermatologic*)

Placental sign, implantation bleeding. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Plantar Reflex sign, irritation of the sole contracts the toes. (*TAIMD* 1909) (*ARPS* 1990) (*IMD* 1974) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Platysmal Eye sign, the act of nipping the platysmamyoides contracts the pupil. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*) (*Ophthalmic*)

Plumb-line sign, the estimation of sternal displacement by a plumb-line in the diagnosis of pleuritic effusion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Respiratory*)

Plumber's Colic sign, poisoning from work exposure to lead. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Plumbism sign, [Henry Burton, English physician] a blue line occurring at the gingival border with teeth. A sign of chronic lead poisoning. Also known as Burton's line and sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Poisoning*)

Plummer's sign, [Henry Stanley Plummer, American physician, 1874-1937] inability to step up onto a chair or to walk up steps, in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Endocrine*)

Pneumatic sign, [Hennebert, Belgium otologist] in the labyrinthitis of congenital syphilis, compression of the air in the external auditory canal produces a rotatory nystagmus to the diseased side; rarefaction of the air in the canal produces a nystagmus to the opposite side. Also known as Hennebert's sign or test. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Infectious disease Immunology*)

Pneumonic sign, free flowing bright red sputum with fever and cough. An indication of pneumonic plague infection. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Polish sign, a thick tangling of the hair with a sticky secretion that has a viscid smell of spoiled vinegar, mice, and garlic. The nails are spongy and blackish. Known in Cracow, Poland as *weichselzopf*, also called by the term plica polonica. If the hair was matted together so as to resemble ropes it is called plica multiformis and if these masses united

together to form one single club of hair, like the tail of a horse, it is known as plica caudiformis. (Saxonia and Minadous 1610) (Lafontaine 1808) (Rayer) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Poncet's sign, [Antonin Poncet, French surgeon, 1846-1913] tuberculous rheumatism. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Pool-Schlesinger sign, [Eugene Hillhouse Pool, American surgeon, 1874-1949, Herman Schlesinger, Austrian physician, 1866-1934] in tetany, if the patient's leg is held at the knee joint and flexed strongly at the hip joint, there will follow within a short time an extensor spasm at the knee joint, with extreme supination of the foot. Also known as Leg sign, Pool's phenomenon and Schlesinger's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Pop-eye Fish sign, MAIC zoonotic disease, *Mycobacterium avium-intracellulare complex*. Carriers are fish, birds, and mammals; causes pulmonary disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Porcupine sign, ichthyosis, morbid development of the papillae and thickening of the epidermic lamellae. Also called Steinhausen's sign. (Steinhausen 1831) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Porphyria sign, urine that darkens on standing to a port wine colour and fluoresces in ultra-violet light. A sign of porphyria. (*ARPS* 1990) (*Renal Reproductive*) (*Genetic*) (*Hematologic*)

Porret's sign, the passage of a continuous current through a living muscle fiber causes an undulation proceeding from the positive toward the negative pole. Also known as Kuhne's muscular phenomenon and Porret's phenomenon. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Port sign, gout as a complication of port wine sweetened with lead. (*ARPS* 1990) (*Renal Reproductive*) (*Nutritional*) (*Poisoning*)

Port-Light Nose sign, rhinophyma. Also called bottle nose. (*ARPS* 1990) (*Otolaryngology*)

Port Wine Urine sign, urine is the color of a dark port wine, muscular weakness and drunken gait. An indication of poisoning with sulphonal. (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Poisoning*)

Porter's sign, [William Henry Porter, Irish physician, 1790-1861] tracheal tugging. A sign of aneurysm of the aorta. Also known as Oliver's sign. (*TAIMD* 1909) (*TAPMD*

1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Otolaryngology*)

Possum Boil sign, leptospirosis infection. Also known as Opossum and Skunk sign. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Posterior Drawer sign, a test to check for rupture of the cruciate ligament of the knee. With the leg flexed at 90 degrees the tibia is then pushed backwards, if it does move more than normal, this indicates rupture. (*ARPS* 1990) (*Muscular Skeletal*)

Postural Reflex sign, a reflex which consists of some assumption of posture. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Potain's sign, [Pierre Carl Edouard Potain, French physician, 1825-1901] 1. extension of percussion dullness over the arch of the aorta, in dilatation of the aorta, from the manubrium to the third costal cartilage on the right-hand side. 2. *timbre metallique*. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Pot Belly sign, a classic presentation of pellagra. (*ARPS* 1990) (*Gastrointestinal*) (*Nutritional*)

Pottenger's sign, [Francis Morison Pottenger, American physician, 1869—] 1. intercostal muscle rigidity on palpation in pulmonary and pleural inflammatory conditions. 2. different degrees of resistance on light touch palpation, noted (1) over solid organs when compared with hollow organs; (2) over foci of disease in the lungs and pleura when compared with that over normal organs. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Respiratory*)

Pott's sign, [Percival Pott, English surgeon, 1713-1788] prominence of the heel and shortening of the dorsum of the foot. A sign of Pott's fracture-dislocation of the ankle. (*ARPS* 1990) (*Muscular Skeletal*)

Pott's Spine sign, [Percival Pott, English surgeon, 1713-1788] osteitis or caries of the vertebrae, usually of tuberculous origin: it is marked by stiffness of the vertebral column, pain on motion, tenderness on pressure, prominence of certain of the vertebral spines. and occasionally abdominal pain, abscess formation, and paralysis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Practolol sign, hyperkeratosis of the feet and palms. Associated with carcinoma of the oesophagus and psoriasis. (*ARPS* 1990) (*Dermatologic*) (*Oncology*) (*Gastrointestinal*)

Prat's sign, the muscles of an injured limb become rigid before gangrene. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Prayer sign, callosity on the forehead, from the Moslem style of praying several times a day, with the forehead touching the ground. (*ARPS* 1990) (*Dermatologic*)

Prehn's sign, [Douglas T. Prehn, American physician] elevation and support of the scrotum will relieve the pain in epididymo-orchitis, but not in torsion of the testicle. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Prepotential Reflex signs, instincts. (*IMD* 1974) (*ARPS* 1990) (*Genetic*) (*Neurologic*)

Pressor Reflex sign, a reflex to stimulation resulting in increased activity of a motor center. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Preston's sign, keratolysis or deciduous skin, a condition in which the whole skin is cast off like a snake in huge contiguous pieces. Also called Serpent sign. (Preston 1881) (Frank 1891) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Prevel's sign, the abdominocardiac reflex, any reflex in the heart produced by stimulating the abdominal sympathetic nerves. Also called Livierato's sign. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Prévost's sign, [Jean Louis Prévost, Swiss physician, 1838-1927] conjugate deviation of the head and eyes, the eyes looking toward the affected hemisphere and away from the palsied extremities. A sign seen in hemiplegia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Preyer's sign, [Thierry Wilhelm Preyer, German physiologist-chemist, 1841-1897] involuntary movements of the ears produced by auditory stimulation. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Price's sign, [Philip Barton Price, American surgeon] press the thumb against the sternum and hold it there for a few seconds, then remove it quickly. If the blanched area does not turn pink in less than a second, this is an indication of early shock. (*ARPS* 1990) (*Cardiovascular*) (*Dermatologic*)

Profichet's sign, [Georges Charles Profichet, French physician, 1873—] Profichet's syndrome. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

Projectile Vomiting sign, a sign seen in infantile pyloric stenosis. (*ARPS* 1990) (*Gastrointestinal*)

Pronation sign, 1. [Joseph François Félix Babinski, French physician, 1857-1932] a patient's paralyzed forearm is placed in supination, but then turns over to pronation. A sign of organic paralysis. 2. [Adolf von Strümpell, German physician, 1853-1925] passive flexion of the forearm caused by pronation; seen in hemiplegia. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Proprioceptive Reflex sign, a reflex that is initiated by stimuli arising from some function of the reflex mechanism itself. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Prosector's Rot sign, paronychia primarily from *Mycobacteruim tuberculosis*, contained within tissue sections. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Proud Flesh sign, exuberant granulation tissue around the opening of sinus track. A sign that signifies necrosis of bone is occurring in the depths of the track. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Prussic sign, giddiness, eyes staring, and teeth clenched. A sign of hydrocyanic acid poisoning. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Oral Maxillofacial*) (*Poisoning*)

Pseudo-Babinski's sign, [Joseph François Félix Babinski, French physician, 1857-1932] in poliomyelitis the Babinski reflex is modified so that only the big toe is extended, because all the foot muscles except the dorsiflexors of the big toe are paralyzed. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*) (*Neurologic*)

Pseudo-Graefe's sign, [Albrecht von Graefe, German ophthalmologist, 1828-1870] slow descent of the upper lid on looking down, and quick ascent on looking up; seen in conditions other than Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Psoas sign, lifting the extended right leg produces psoas muscule pain, seen in appendicitis. (*ARPS* 1990) (*Muscular Skeletal*) (*Gastrointestinal*)

Psyche sign, an experience or effect produced without physical agency or intermediation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Psychic Reflex sign, a reflex aroused by a stored-up impression of memory, such as the secretion of saliva at the sight or thought of good tasting food. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Psychocardiac sign, increase in the pulse rate on recalling an individual emotional experience. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Psychogalvanic sign, decreased electric resistance of the body as a result of mental or emotional agitation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Puddle sign, in examination for ascites, a method for detecting free fluid in the abdominal cavity. The patient lies prone for five minutes, then rises to his hands and knees. While the examiner lightly flicks a finger against one flank, a Bowles stethoscope is moved slowly from the most dependent part of the abdomen to the flank. That part of the ventral abdomen containing the fluid puddle shows a loss of high-frequency vibration, which will be detected as soon as the edge of the fluid is reached, indicating the amount of fluid. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Pulmonocoronary sign, reflex vasoconstriction of the coronary arteries, mediated by the vagus nerves. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Pupillary Reflex sign, contraction of the pupil on exposure of the retina to light. Also called Iris-contraction reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Pupillary Reflex Paradoxic sign, stimulation of the retina by light dilates the pupil. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Purkinje's sign, the phenomenon that fields of equal brightness but different color become unequally bright if the intensity of the illumination is decreased. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Purple Foot sign, trench foot. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Purple Hair sign, hair becomes purplish brown when the scalp is treated with chrysarobin and then washed with an alkali soap. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Purple Teeth sign, when tetracyclines are administered during tooth development they are incorporated into the dentin and enamel of teeth. These teeth can present with purplish bands or general blue purple shading. The teeth fluoresce brilliant yellow in ultraviolet light. (*ARPS* 1990) (*Oral Maxillofacial*)

Puumala sign, rapid fever, kidney failure, severe back pain, and bleeding rash which progresses to death in 15 percent of victims. Caused by a zoonotic hantaviral infectious process known as hemorrhagic fever with renal syndrome disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Renal Reproductive*) (*Dermatologic*) (*Death*)

Puusepp's sign, [Lyudvig Martinovich Puusepp, Estonian neurosurgeon, 1875-1942] abduction of the little toe on stimulating the posterior external part of the sole of the foot; indicative of lesion of the extrapyramidal and pyramidal tract. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Pyramid sign, any sign pointing to disease of the pyramidal tract. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Pyramidal sign, any sign pointing to disease of the pyramidal tract. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Q sign, endocarditis, pneumonia, fever, and liver involvement caused by the zoonotic *Coxiella burnetii* found in many mammals, including cattle, sheep, cats, dogs, rodents, birds, and ticks. Also called Q or Query Fever. (*ARPS* 1990) (*Infectious disease Immunology*)

Quadriceps sign, contraction of the quadriceps and extension of the leg when the quadriceps tendon is tapped between the patella and the tibial tubercle. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Quadrupedal Extensor sign, an extension of the hemiplegic flexed arm when the patient assumes the quadrupedal position; called also Brain's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Quant's sign, a T-shaped depression in the occipital bone, sometimes seen in rickets. (*IMD* 1974) (*ARPS* 1990) (*Nutritional*) (*Muscular Skeletal*)

Quarter Evil sign, symptomatic anthrax. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Queckenstedt's sign, [Hans Heinrich Georg Queckenstedt, German physician, 1876-1918] when the veins in the neck are compressed on one or both sides, there is a rapid rise in the pressure of the cerebrospinal fluid of healthy persons, and this rise quickly disappears when pressure is taken off the neck. But when there is a block in the vertebral canal the pressure of the cerebrospinal fluid is little or not at all affected by this maneuver. Also known as Jugular sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Quénu-Muret sign, [Eduard André Victor Alfred Quénu, French Surgeon, 1852-1933, Paul Louis Muret, French surgeon, 1878—] in aneurysm, the main artery of the limb is compressed and then a puncture is made at the periphery; if blood flows, the collateral circulation is probably established. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Quincke's sign, [Heinrich Irenaeus Quincke, German physician, 1842-1922] a blanching of the fingernails at each diastole of the heart. A sign seen in aortic insufficiency. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Dermatologic*)

Quincke's Skin sign, [Heinrich Irenaeus Quincke, German physician, 1842-1922] giant urticaria; urticaria oedematosa. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Quinquaud's sign, [Charles Eugene Quinquaud, French physician, 1843-1894] trembling of the patient's fingers felt when his fingers spread apart are placed vertically in the palm of the examiner's hand. A sign of alcoholism. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Quinquaud's Scalp sign, a purulent folliculitis of the scalp, causing irregular bald patches. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Rabbit Fever sign, tularemia infection. (*ARPS* 1990) (*Infectious disease Immunology*)

Rabbit Starvation sign, severe vitamin deficiency often leading to death, when only rabbit is consumed without vegetables during a season. Vitamins and minerals are lost digesting the rabbit and passed out in the faeces and are not replaced because rabbit flesh lacks fat and essential vitamins. (*ARPS* 1990) (*Nutritional*) (*Death*)

Raccoon Blindness sign, neural larval migrans, liver enlargement, loss of attentiveness, blindness, and coma. This serious disease is caused by the ingestion of raccoon faeces containing the embryonic eggs from the zoonotic *Baylisascaris procyonis* roundworm. Responsible for fatal meningoencephalitis in infants. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Neurologic*) (*Death*)

Raccoon Eyes sign, the periorbital bruising associated with anterior basilar skull fracture and neuroblastoma. Sometimes associated with the reservoir phenomenon of cerebrospinal fluid pooling in the sinus cavity. Also known as "panda eyes." (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Otolaryngology*) (*Dermatologic*) (*Ophthalmic*) (*Oncology*)

Radial sign, flexion of the forearm, following tapping on the lower end of the radius; when the fingers flex as well, it indicates hyperreflexia. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Radialis sign, [Adolf von Strümpell, German physician, 1853-1925] inability to close the fist without marked dorsal extension of the wrist. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Radovici's sign, palmchin reflex. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Raggi's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] claustrophobia, the fear of being within an enclosure or small space. (Raggi 1878) (Suckling 1890) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Rag-sorters's sign, 1. malignant pustule in rag-sorters. 2. a febrile disease with cough and headache, seen in rag-sorters, and due probably to a bacillus. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Railroad sign, transit tetany in ruminants. (*ARPS* 1990) (*Muscular Skeletal*) (*Death*)

Raimiste's sign, the patient's hand and arm are held upright by the examiner: if the hand is sound, it remains upright on being released; if paretic the hand flexes abruptly at the wrist. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Rain Rot sign, pustular desquamative dermatitis, caused by the zoonotic fungal *Dermatophilus congolensis*. Found in horses, cattle, sheep, deer, and other mammals worldwide. Also called Rain Scald sign and Dew Poisoning sign. (*ARPS* 1990) (*Infectious disease Immunology*)

Rain Scald sign, zoonotic fungal *Dermatophilus congolensis*, see Rain Rot sign. (*ARPS* 1990) (*Infectious disease Immunology*)

Rajneeshee sign, foodborne zoonotic salmonellosis. (*ARPS* 1990) (*Infectious disease Immunology*)

Ramaninjana sign, a form of jumping disease, found in Madagascar. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Ramond's sign, [Louis Ramond, French internist, 1879-1952] rigidity of the erector spinae muscle indicative of pleurisy with effusion; the rigidity relaxes when the effusion becomes purulent. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Muscular Skeletal*)

Ramsay's sign, [Emil Theodor Kocher, Swiss surgeon, 1841-1917, James Ramsay Hunt, American neurologist, 1872-1937] when following the examiner's raising hand, the

patient's upper lid springs up more quickly than the eyeball. A sign of Graves' disease. Also known as Kocher's sign. (Kocher 1874) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Ramus sign, the patient is supporting his jaw, speech is impossible and there is blood stained saliva. This is a sign of a jaw fracture, the fractures are almost always compound and ninety-five percent of jaw fractures occur in the horizontal ramus. (*ARPS* 1990) (*Oral Maxillofacial*)

Rasch's sign, [Hermann Rasch, German obstetrician, 1873—] fluctuation of the liquor amnii obtained as by ballottement in early pregnancy. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Rash-extinction sign, Schultz-Charlton reaction phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*)

Rasin's sign, [Stefan Jellinek, Austrian physician, 1871—] the pigmentation, usually brownish, occurring on the lid margins in many cases of hyperparathyroidism. Also known as Jellinek's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Dermatologic*)

Raspberry sign, contagious raspberry like nodules beginning with minute red spots, then after seven days form yellow papules, then the raspberry crust, sometimes with edema of the limbs and eyelids. Also called by the Carib word *yaws* and the French *framboise* or *frambesia.* Believed to be the same as button-scurvy of Ireland. (Oviedo 1535) (Lebat 1722) (Crocker) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Rat sign, [Bart Weejens, Belgian researcher] when a rat trained to detect tuberculosis has a positive finding from smelling a patient's saliva. African giant pouched rats which are the species currently used for the tuberculosis diagnostics have also been trained to sniff for TNT and locate land mines. (Mairson) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Raynaud's sign, [Maurice Raynaud, French physician, 1834-1881] a cold pale condition of the fingers and toes alternating with heat and redness. An early sign of asymmetric gangrene or Raynaud's disease. Also known as acro-asphyxia or Dead-finger sign and sphaceloderma. (Raynaud) (Osler) (*AACM* 1896) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Raynaud's Throat sign, [Maurice Raynaud, French physician, 1834-1881] paralysis of the throat-muscles following parotiditis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*) (*Oral Maxillofacial*) (*Neurologic*)

Razdolskii's sign, (Ivan Yakovlievich Razdolskii, Russian neurologist, 1880-1962) striking the spina iliaca causes a reflexive contraction of the contralateral adductors. Also called Razdolsky's sign. (Razdolskii 1924) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Rebound sign, a manifestation of loss of coordination between groups of antagonistic muscles of the extremities in cerebellar dysfunction. It may be demonstrated by having the patient extend both arms horizontally, the examiner then tapping both outstretched arms sharply. The normal arm returns to position promptly, whereas the affected arm overshoots the original position and may oscillate several times before achieving it. Or, the patient rests his elbow on a table and tries to flex his arm against the resistance of the examiner. When the resistance is suddenly withdrawn, the affected arm rebounds to the patient's chest, whereas the normal arm flexes only slightly, the flexion being arrested by contraction of antagonistic muscles (the triceps). (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Recession sign, the supraclavicular fossa and epigastrium are sucked in during inspiration. If this is significant, then tracheotomy or intubation are urgent. (*ARPS* 1990) (*Respiratory*)

Recklinghausen's sign, [Friedrich Daniel von Recklinghausen, German pathologist, 1833-1910] multiple neurofibromata. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*)

Reclotting sign, thixotropy. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Reclus's sign, [Paul Reclus, French surgeon, 1847-1914] a painless cystic enlargement of the mammae, marked by multiple dilatations of the acini and ducts. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Endocrine*)

Rectal Reflex sign, the process by which the accumulation of faeces in the rectum excites defecation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Gastrointestinal*)

Red Eye Traveler's sign, keratitis and acute diarrhea from a *Microsporidia* zoonotic protozoal-fungal infection. (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Gastrointestinal*)

Red Jelly sign, foul smelling faeces containing blood and mucus, that looks like red jelly. A sign of amoebic dysentery. (*ARPS* 1990) (*Gastrointestinal*) (*Infectious disease Immunology*)

Red-Currant Jelly sign, stool of intussusception. (*ARPS* 1990) (*Gastrointestinal*)

Red Reflection sign, a luminous red appearance seen upon the retina. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Regional Reflex sign, a reflex controlled by a single segment or region of the spinal cord. Also called Segmental Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Reichmann's sign, [Nikolas Reichmann, Polish physician, 1851-1918] continuous secretion of gastric juice; gastrosuccorrhea. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Relapsing sign, a zoonotic louseborne *Borrelia* disease, causing a relapsing fever every three to five days. Also called relapsing fever disease. (*ARPS* 1990) (*Infectious disease Immunology*)

Release sign, the unhampered activity of a lower center when a higher inhibiting control is removed. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Remak's sign, [Ernst Julius Remak, German neurologist, 1848-1911] a double sensation caused by pricking with a needle. A sign of tabes dorsalis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Rendu's sign, [Henri Jules Marie Rendu, French physician, 1844-1902, Frederick Parkes Weber, English physician, 1863-1962, Sir William Osler, Canadian physician, 1849-1919] telangiectases around the mouth found in the malabsorption Osler-Weber-Rendu disease. (*ARPS* 1990) (*Nutritional*) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Dermatologic*)

Renointestinal sign, inhibition of motility of the intestine resulting from renal irritation. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*)

Renorenal sign, a reflex pain or anuria in a sound kidney in cases in which the other kidney is diseased. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Resistance Reflex sign, [Joseph François Félix Babinski, French neurologist, 1857-1932] dorsiflexion of the big toe on stimulating the sole of the foot; it occurs in lesions of the pyramidal tract, and indicates organic, as distinguished from hysteric, hemiplegia. Called also Babinski's Reflex sign and Toe sign. (Babinski 1896) (Babinski 1917) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Retrobulbar Pupillary sign, slight dilatation of the pupil which contracts under light stimulation, and then dilates while the light stimulation is still present. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Reusner's sign, increased volume of the pulse in the uterine arteries perceptible in Douglas's cul-de-sac. A sign found in the fourth month of pregnancy or later. (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*) (*Renal Reproductive*)

Reversed Three sign, on radiography of the aorta there appears to be a pair of bulges indicating coarctation. Also known as E sign, Figure Three sign and Three sign. (*ARPS* 1990) (*Cardiovascular*)

Revilliod's sign, [Jean Leonard Adolphe Revilliod, Swiss physician, 1835-1918] the inability to close the eye. A sign of paralysis on the affected side of the superior facial nerve. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Rhagades sign, white linear scars which radiate from the corners of the mouth. A sign of congenital syphilis. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Infectious disease Immunology*)

Rhodesian Sleeping sign, [Africa] zoonotic trypanosomiasis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Rhodius's sign, the sweetness of sweat after the ingestion of honey. (Rhodius 1654) (*AACM* 1896) (*ARPS* 1990) (*Nutritional*) (*Dermatologic*)

Rice Breast sign, eosinophilia and muscle pain. Caused by the ingestion of faeces, raw pork, or beef containing the zoonotic *Sarcocystis* protozoan. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Muscular Skeletal*) (*Nutritional*)

Rice Water sign, grey liquid diarrhoea with the appearance of rice water. A sign of cholera. (*ARPS* 1990) (*Gastrointestinal*) (*Infectious disease Immunology*)

Richardson's sign, [Sir Benjamin Ward Richardson, English physician, 1828-1896] the application of a tight fillet to the arm as a test of death. If life be present the veins on the distal side of the fillet become more or less distended. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Death*)

Rickety Rosary sign, pediatric enlargement of the costochondral articulations. A sign of rickets. (*ARPS* 1990) (*Nutritional*) (*Muscular Skeletal*)

Riddoch's Mass Reflux sign, [George Riddoch, British neurologist, 1888-1947] in severe injury of the spinal cord, stimulation below the level of the lesion produces flexion reflexes of the lower extremity, evacuation of the bowels and bladder, and sweating of the skin below the level of the lesion. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Renal Reproductive*) (*Gastrointestinal*) (*Dermatologic*)

Riedel's sign, [Bernhard Moritz Carl Ludwig Riedel, German surgeon, 1846-1916] ligneous thyroiditis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*)

Rieger's sign, a state of disconnectedness or unreality experienced by high-altitude pilots. Its symptomatic sensations are apparently indescribable in understandable physical terms, but the condition could be the result of a loss of all the physical sense perceptions. Also known as break-off phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Riesman's sign, [David Riesman, American physician, 1867-1940] a bruit heard with the stethoscope over the closed eye in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Riesman's Coma sign, [David Riesman, American physician, 1867-1940] softening of the eyeball in diabetic coma. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Riga's sign, cachectic aphthae. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Rigg's sign, alveolar pyorrhea. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Righting Reflex sign, the ability to assume optimal position when there has been a departure from it. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Rim sign, with perfused kidney tomography only the thin cortex rim is visible indicating non-perfusion to the other parts of the cortex. Also known as Cortical Rim sign. (*ARPS* 1990) (*Renal Reproductive*) (*Cardiovascular*) (*Renal Reproductive*)

Rinman's sign, the appearance of cord like radiations proceeding from the nipple. An early sign of pregnancy. (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*) (*Renal Reproductive*)

Ripault's sign, [Louis Henry Antoine Ripault, French physician, 1807-1856] external pressure upon the eye during life causes only a temporary change in the normal roundness of the pupil. However, after death the change so caused may be permanent. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Death*)

Ritter's sign, [Gottfried Ritter von Rittershain, German physician, 1820-1883] dermatitis exfoliativa neonatorum, with diffuse and universal scaling, which may be branny or in laminae like pityriasis rubra. (Ritter) (Crocker) (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Ritter-Rollet sign, [Johann Wilhelm Ritter, German physicist, 1776-1810] the flexion of the foot on gentle electric stimulation and extension of the foot on energetic stimulation. Also known as Ritter-Rollet phenomenon. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Rivalta's sign, [Sebastiano Rivalta, Italian veterinarian] actinomycosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Riviere's sign, [Clive Riviere, British physician, 1873-1929] an area of change in percussion note denoting a band of increased density across the back at the plane of the spinous processes of the fifth, sixth, and seventh dorsal vertebrae: a sign of pulmonary tuberculosis. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Rivolta's sign, actinomycosis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Robertson's sign, [William Egbert Robertson, American physician, 1869-1956] 1. fibrillary contraction of the pectoralis muscle over the cardiac area in approaching death from heart disease. 2. absence of pupillary dilatation on pressure over alleged painful areas in malingering. 3. in ascites, fullness and tension in the patient's flanks, felt by the examiner with the patient supine. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Ophthalmic*) (*Death*)

Robinson's sign, [Andrew R. Robinson, American dermatologist, 1845—] hidrocystoma. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Roche's sign, in torsion of the testis, the epididymis cannot be distinguished from the body of the testis, whereas in epididymitis the body of the testis can be felt in the enlarged crescent of the epididymis. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Rocher's sign, [Rocher, French surgeon] a test to check for rupture of the cruciate ligament of the knee. With the leg flexed at 90 degrees the tibia is then pushed backwards, if it does move more than normal, this indicates rupture. Also called Posterior Drawer sign. (*ARPS* 1990) (*Muscular Skeletal*)

Rockey's sign, [Alpha Eugene Rockey, American surgeon, 1857-1927] two straight edges are placed vertically at the outer edges of the orbits from the prominence of the zygomatic bone: if depression fracture of the zygomatic arch exists, the difference in the two angles is obvious. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Ophthalmic*)

Rodent Ulcer sign, [Sir Charles Mansfield Clarke, English physician, 1782-1857] malignant ulcer situated above a line which joins the angle of the mouth and the tragus of the ear. Called a rodent ulcer because the wound looks like a rat has gnawed at the tissue and bone. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Otolaryngology*) (*Oncology*)

Roger's sign, [Henri Louis Roger, French physician, 1809-1891] the presence of an abnormal congenital communication between the ventricles of the heart. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Roger's Reflux sign, salivation on irritation of the esophagus. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*)

Rokitansky's sign, [Karl Freiherr von Rokitansky, Austrian pathologist, 1804-1878] acute yellow atrophy of the liver. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Rolling Ship sign, [Hebert Campbell Thomson, English physician, 1870-1940] the patient walks as though on a rolling ship. The gait seen with cerebellar tumour. (*ARPS* 1990) (*Neurologic*)

Romaña's sign, [Cecilio Romaña, Brazilian physician] unilateral ophthalmia with palpebral edema, conjunctivitis, and swelling of reponal lymph glands as a sign of Chagas' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Infectious disease Immunology*)

Romberg's sign, [German neurologist, Moritz Heinrich Romberg, Berlin physician, 1795-1873] swaying of the body when the subject is standing with the feet close together and the eyes closed. A sign of ataxia. Also known as Brach's sign and Brauch-Rhomberg's sign. (Romberg) (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Rhomboid sign, central papillary atrophy of the tongue, associated with the presence of *Candida albicans*. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Rommelaere's sign, [Guillaume Rommelaere, Belgian physician, 1836-1916] an abnormally small proportion of normal phosphates and of sodium chloride in urine. A sign seen in cancerous cachexia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Oncology*)

Rooting Reflex sign, a reflex in the newborn in which stimulation of the side of the cheek or the upper or lower lip causes the infant to turn his mouth and face to the stimulus. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Rope sign, acute angulation between chin and larynx, due to weakness of hyoid muscles, noted in bulbar poliomyelitis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Neurologic*) (*Otolaryngology*)

Rosary Bead sign, examination of the uterus reveals an irregular appearance with rosary like nodular structures in the tuba uterina. A sign of genital tuberculosis. (Canga 1961) (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*)

Rose Handler's sign, ulcerative skin lesions with nodular lymphangitis, due to exposure to the zoonotic fungal *Sporothrix schenckii*, found on peat moss, horses, laboratory animals, other mammals, and birds. (*ARPS* 1990) (*Infectious disease Immunology*)

Rose Spots sign, rose spots on the abdomen with typhoid fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Rosenbach's sign, [Ottomar Rosenbach, German physician, 1851-1907] 1. absence of the abdominal skin reflex in inflammatory disease of the intestines. 2. absence of the abdominal skin reflex in pinching the skin of the abdomen on the paralyzed side in hemiplegia. 3. a fine rapid tremor of the closed eyelids in Graves' disease. 4. inability to close the eyes immediately on command; seen in neurasthenia. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Gastrointestinal*) (*Ophthalmic*) (*Neurologic*)

Rosenheim's sign, a friction sound in the left hypochondrium. A sign of perigastritis. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*)

Rosenthal's sign, stabbing and burning pain caused by faradic current applied to the spinal column. A sign of spondylitis. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Roser's sign, [Wilhelm Roser, German surgeon, 1817-1888] the absence of dural pulsation. A sign of cerebral tumor or abscess. Also known as Roser-Braun sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*) (*Infectious disease Immunology*) (*Oncology*)

Roser-Braun sign, [Wilhelm Roser, German surgeon, 1817-1888] the absence of dural pulsation. A sign of cerebral tumor or abscess. Also known as Roser's sign. (*TAIMD*

1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*) (*Infectious disease Immunology*) (*Oncology*)

Ross River Rash sign, [Australia, South Pacific Islands] purpura on the lower extremities with fever and polyarthritis. Caused by the mosquito-borne zoonotic Ross River alphavirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*)

Rossbach's sign, [Michael Josef Rossbach, German physician, 1842-1894] hyperchlorhydria. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Rössle's sign, [Robert Rössle, German pathologist, 1876-1956] plantar hypersensitivity. A sign in thrombosis. (Rössle 1926) (*ARPS* 1990) (*Dermatologic*) (*Cardiovascular*)

Rossolimo's sign, [Gregorij Ivanovich Rossolimo, Russian neurologist, 1860-1928] plantar flexion occurs after tapping the plantar surface of the toes if there are lesions of the pyramidal tract. Also called Rossolimo's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Rossolimo's Anal sign, [Gregorij Ivanovich Rossolimo, Russian neurologist, 1860-1928] anal reflex. (Rossolimo 1891) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Rostan's sign, [Louis Leon Rostan, French physician, 1790-1866] gangrene of the penis associated with small pox. (Rostan 1853) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Renal Reproductive*)

Rot's sign, [Vladimir Karlovich Roth, Russian neurologist, 1848-1916] meralgia paraesthetica. Also called Roth's Thigh sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Rotch's sign, [Thomas Morgan Rotch, American physician, 1849-1914] dullness on percussion of the right fifth intercostal space. A sign of pericardial effusion. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Roth's sign, percussional dulness between the fifth and sixth costal cartilages. It is a sign of either tricuspid stenosis and dilatation of the right auricle or to a pericardial effusion. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Roth's Thigh sign, [Vladimir Karlovich Roth, Russian neurologist, 1848-1916] meralgia paraesthetica. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Rothschild's sign, preternatural flattening and mobility of the sternal angle. A sign seen in phthisis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Rothschild's Eye sign, rarefaction of the outer third of the eyebrows in thyroid inadequacy. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Rougnon-Heberden sign, [Nicolas François Rougnon, French physician, 1727-1799, Sir William Heberden, English physician, 1710-1801] angina pectoris. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Roussel's sign, [Théophile Roussel, French physician, 1816-1903] sharp pain on light percussion on the subclavicular region between the clavicle and the fourth rib. A sign of incipient tuberculosis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Rovighi's sign, [Alberto Rovighi, Italian physician, 1856-1919] a fremitus felt on percussion and palpation of a superficial hepatic hydatid cyst. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*)

Rovsing's sign, [Thorkild Rovsing, Danish surgeon, 1862—] pressure on the left side over the point corresponding to McBurney's point will elicit the typical pain at McBurney's point in appendicitis, but not in other abdominal infections. Also known as Rovsig's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Infectious disease Immunology*)

Ruggeri's sign, acceleration of the pulse following strong convergence of the eyeballs toward something very close to the eyes; it indicates sympathetic excitability. Also known as Ruggeri's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*) (*Cardiovascular*)

Rum Fits sign, *delirium tremens*, associated with alcohol withdrawal, also called The Horrors sign and The Shakes sign. (*ARPS* 1990) (*Neurologic*)

Rummo's sign, [Gaetano Rummo, Italian physician,—1917] cardioptosia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Rumpel-Leede sign, [Theodor Rumpel, German surgeon, 1862-1923, Carle Stockbridge Leede, German-American physician, 1882-1964] the appearance of minute subcutaneous haemorrhages below a bandage applied to the upper arm for ten minutes. A sign of haemorrhagic diathesis, capillary fragility, and scarlet fever. (Rumple 1909) (Leede 1911)

(*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Cardiovascular*) (*Infectious disease Immunology*)

Rumpf's sign, [Heinrich Theodor Marie Rumpf, German physician, 1851—] 1. alternating fibrillary and tonic contractions after the cessation of strong faradization; seen in traumatic neuroses. Called also Rumpf's traumatic reaction. 2. quickening of the pulse on pressure over a painful point; seen in neurasthenia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*) (*Muscular Skeletal*)

Russ's sign, loss of speech after the bites of venomous snakes. (Russ 1861) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Poisoning*)

Russian Horse sign, glanders, a zoonotic bacterium *Burkholderia mallei*, that causes skin and mucous membrane lesions, as well pneumonia. The bacteria has been used as a biological warfare weapon in World Wars I and II. (*ARPS* 1990) (*Infectious disease Immunology*)

Russian Summer sign, paralysis of the arms, encephalitis, brain damage, and high mortality. Caused by the bite of ticks infected with the Far Eastern Russian encephalitis flavivirus, also called Russian spring-summer encephalitis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Death*)

Rust's sign, [Johann Nepomuk Rust, German surgeon, 1775-1840] the patient supports his head with his hands while moving the body. A sign seen in caries or malignant disease of the cervical vertebrae. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*)

Saber Shin sign, [Jean Alfred Fournier, French dermatologist, 1832-1914] the sharp delimitation characteristic of a syphilitic skin lesion. Also known as Fournier's sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Sabia sign, [South America] fever and bleeding caused by the zoonotic Brazilian hemorrhagic fever *Arenaviridae* virus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Hematologic*)

Sacral sign, pitting oedema over the sacrum. (*ARPS* 1990) (*Dermatologic*) (*Muscular Skeletal*)

Saegesser's sign, [Max Saegesser, Swiss surgeon] violent pain on deep finger pressure between the sternomastoid and the scalenus medius. A sign of splenic rupture and

intracapusular haemorrhage. Also called the splenic point. (*ARPS* 1990) (*Otolaryngology*) (*Muscular Skeletal*) (*Hematologic*) (*Gastrointestinal*)

Saenger's sign, [Alfred Saenger, German neurologist, 1861-1921] a light reflex of the pupil that has ceased returns after a short stay in the dark; observed in cerebral syphilis but not in tabes dorsalis. Also called Saeger's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Infectious disease Immunology*)

Saint Agatha's sign, mammitis. (*TAIMD* 1909) (*ARPS* 1990)

Saint Aignon's sign, tinea favosa. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint Anthony's sign, epidemic gangrene, erysipelas. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint Anthony's Fire sign, staggering, barking like a dog, sometimes dancing wildly to no music and often accompanied with an irrational fear of demons and the need to hide from them. An indication of ergot poisoning. Also known as Dancing Madness sign. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Apollonia's sign, toothache. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Saint Avertin's sign, epilepsy. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Saint Avidus's sign, deafness. (*TAIMD* 1909) (*ARPS* 1990) (*Otolaryngology*)

Saint Blasius's sign, quinsy. (*TAIMD* 1909) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*) (*Otolaryngology*)

St. Clair's sign, ancient eye disorder. (*TAIMD* 1909) (*ARPS* 1990) (*Ophthalmic*)

Saint Dymphna's sign, insanity. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Saint Erasmus's sign, colic. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*)

Saint Fiacre's sign, hemorrhoids. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*)

Saint Francis's sign, erysipelas. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Saint Gervasius's sign, rheumatism. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*)

Saint Gete's sign, carcinoma. (*TAIMD* 1909) (*ARPS* 1990) (*Oncology*)

Saint Giles's sign, leprosy. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint Giles's Black sign, carcinoma. (*TAIMD* 1909) (*ARPS* 1990) (*Oncology*)

Saint Guy's sign, dancing in wild delirium often for many hours accompanied with an irrational fear of demons and drowning in blood, as well as, sometimes visions of heaven and the Savior enthroned with the Virgin Mary. An indication of ergot poisoning. Also known as *chorus sancti viti*, the lascivious dance, choromania, tanzplage, and orchestromania. Most commonly called Dancing Madness Sign. (Paracelsus) (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Hubert's sign, hydrophobia. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Saint Job's sign, syphilis. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint John's Evil sign, c. 1374, the sign used to describe a patient suffering from epilepsy, but the sign is an indication of ergot poisoning, which caused the dancing mania. See the Dancing Madness sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Kilda's sign, tetanus neonatorum. (Macaulay 1764) (Turner 1895) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Saint Lazare's sign, leprosy. (Dupouy) (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Saint Louis Headache sign, [Missouri] fever, headache, disorientation, coma, encephalitis with cerebellar involvement, can progress to mortality. Caused by the bite of a mosquito infected with the zoonotic St. Louis encephalitis flavivirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Death*)

Saint Main's Evil sign, the sign of a patient suffering from scabies. Also called Saint Main's disease. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Saint Martin's Evil sign, the sign of a patient suffering from alcoholism. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Poisoning*)

Saint Mathurin's sign, idiocy. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Saint Modesti's sign, dancing in wild delirium often for many hours accompanied with an irrational fear of demons and drowning in blood, as well as, sometimes visions of heaven and the Savior enthroned with the Virgin Mary. An indication of ergot poisoning. Also known as *chorus sancti viti*, the lascivious dance, choromania, tanzplage, and orchestromania. Most commonly called Dancing Madness Sign. (Paracelsus) (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Modestus's sign, chorea, see Modesti's sign. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Roch's sign, plague. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint Sement's sign, syphilis. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Saint Valentine's sign, epilepsy. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Saint Vitus's sign, c. 1418, dancing in wild delirium often for many hours accompanied with an irrational fear of demons and drowning in blood, as well as, sometimes visions of heaven and the Savior enthroned with the Virgin Mary. An indication of ergot poisoning. Also known as *chorus sancti viti*, the lascivious dance, choromania, tanzplage, and orchestromania. Most commonly called Dancing Madness Sign and Sydenham's chorea. (Paracelsus) (Hecker 1859) (*AACM* 1896) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint With's sign, dancing in wild delirium often for many hours accompanied with an irrational fear of demons and drowning in blood, as well as, sometimes visions of heaven and the Savior enthroned with the Virgin Mary. An indication of ergot poisoning. Also known as *Chorus sancti viti*, the lascivious dance, choromania, tanzplage, and orchestromania. Most commonly called Dancing Madness Sign. (Paracelsus) (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Saint Zachary's sign, dumbness. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Saldana sign, [Afghanistan] fever, pancytopenia, hepatosplenomegaly, caused by the zoonotic transmission of a protozoal *Leishmania* species by the bite of phlebotomine

sand flies. The disease can exist in visceral, cutaneous, and mucosal forms. (*ARPS* 1990) (*Infectious disease Immunology*)

Salisbury and Melvin's sign, as death approaches, the blood in the retinal vessels gradually ceases to move and the column of blood splits into fragments. Also known as Ophthalmoscopic sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Death*)

Salivation sign, free flow of saliva, bluish or greenish vomited material, strong coppery taste. A sign of poisoning with copper salts. Also known as Verdigris sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Poisoning*)

Salt sign, [Florida] a form of enzootic marasmus due to a cobalt deficiency. (*ARPS* 1990) (*Nutritional*) (*Death*)

Salzer's sign, priapism lasting more than a month with enlarged spleen. An indication of leukemia. (Salzer 1879) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*) (*Hematologic*) (*Gastrointestinal*) (*Oncology*)

Sandbox sign, adenopathy, brain abscess, and fetal damage from exposure to cat faeces, containing the zoonotic *Toxoplasma gondii* protozoan. (*ARPS* 1990) (*Infectious disease Immunology*)

Sanders's sign, an undulating cardiac impulse, especially at the epigastrium. A sign of pericardial adhesion. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Cardiovascular*)

Sandfly sign, headache and blood shot eyes following fly bites. A sign of Sandfly fever. Also called *kalazar* in Hindi, meaning black disease. (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Infectious disease Immunology*)

Sandwich sign, a sign of ceremonial mutilation in which natives of the Sandwich Islands knock out one to four teeth. (Cook) (*AACM* 1896) (*ARPS* 1990) (*Oral Maxillofacial*)

Sandworm sign, [Australia] inflammation and spiral erythema on the inner side of the sole. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Sansom's sign, [Arthur Ernest Sansom, English physician, 1838-1907] 1. marked increase of the area of dulness in the second and third intercostal spaces. A sign of pericardial effusion. 2. a rhythmic murmur heard with the stethoscope applied to the lips. A sign of aneurysm of the thoracic aorta. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

São Paulo sign, severe rash on wrists and ankles. A sign of Rocky Mountain Spotted fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Sapa sign, delirium and chronic lead poisoning from sweet defrutum and sapa boiled in lead pots. Sapa is also used in cosmetics and to sweeten food and wine. (*ARPS* 1990) (*Nutritional*) (*Poisoning*) (*Neurologic*)

Sarbo's sign, [Arthur von Sarbo, Hungarian neurologist, 1867—] analgesia of the peroneal nerve. A sign sometimes noticed in locomotor ataxia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

SARS sign, [China and South Asia] fever, headache, pneumonia, and diarrhea. Some 10 percent of these cases are fatal. Severe acute respiratory syndrome caused by a zoonotic coronavirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*) (*Death*)

Sartian sign, a facial skin disease endemic in Asiatic Russia: probably furunculus orientalis. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious* disease *Immunology*) (*Dermatologic*)

Satellite sign, the more luxuriant development of a colony of microorganisms when in the neighborhood of a foreign colony, as shown by *Hemophilus infiuenzae* when contaminated by *Staphylococcus pyogenes* var. *aureus*. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Saturnine sign, gout as a complication of port wine sweetened with lead. (*ARPS* 1990) (*Nutritional*) (*Poisoning*) (*Renal Reproductive*)

Saunders' sign, [Edward Watt Saunders, American physician, 1854-1927] on wide opening of the mouth, there takes place in children associated movements of the hand consisting of opening of the hand and extension and separation of the fingers; called also mouth-and-hand synkinesia. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Oral Maxillofacial*)

Saunders' Sugar sign, [Edward Watt Saunders, American physician, 1854-1927] a dangerous condition seen in infants having digestive disturbances, to whom have been given a large percentage of carbohydrates. It is marked by vomiting, cerebral symptoms, and depression of circulation. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Neurologic*) (*Cardiovascular*) (*Nutritional*)

Savill's sign, epidemic exfoliative dermatitis with discrete papules which become fused into crimson raised maculae, progressing to red thickened patches and desquamation of the epidermis. (Savill 1895) (*AACM* 1896) (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*)

Scapular sign, a stimulus applied between the scapulae contracts the scapular muscles; Called also Interscapular reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Scapulohumeral sign, adduction with outward rotation of the humerus produced by percussing along the inner edge of the scapula. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Scarlet Milk sign, brightly flushed face with circumoral palor around the mouth. A sign of scarlet fever. (*ARPS* 1990) (*Oral Maxillofacial*) (*Dermatologic*) (*Infectious disease Immunology*)

Schäffer's Reflex sign, [Max Schäffer, German neurologist, 1852-1923] flexion of the foot and toes on pinching the Achilles tendon at its middle third; seen in organic hemiplegia. Also called Schaeffer's reflex. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Schamberg's sign, a peculiar progressive pigmentary skin eruption of inflammatory character. (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*)

Schapiro's sign, when the patient lies down, the heart rate does not decrease. Seen in cases of a weak myocardium. (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Schellong-Strisower sign, fall of systolic blood pressure on assuming an erect posture from the lying down position. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Schepelmann's sign, in dry pleurisy, the pain is increased when the patient bends his body toward the normal side. whereas in intercostal neuralgia it is increased by bending toward the affected side. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Respiratory*)

Schick's sign, [Bela Schick, Hungarian-American paediatrician, 1877—] stridor heard on expiration in an infant with tuberculosis of the bronchial glands. (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Schimmelbusch's sign, [Curt Schimmelbusch, German surgeon, 1860—] cystic changes in the breast associated with a cecum adhesion to the ovary or ovarian tube causing inflamation. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Gastrointestinal*) (*Endocrine*)

Schistorrhachis sign, spina bifida. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Schlatter's sign, [K. Schlatter, Swiss surgeon, 1864—] the ligamentum patellae tibia tuberosity is painful on pressure, due to separation of the tubercle. Seen in young athletes. Also called Schlatter-Osgood disease. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Schlesinger's sign, [Herman Schlesinger, Austrian physician, 1866-1934] in tetany, if the patient's leg is held at the knee joint and flexed strongly at the hip joint, there will follow within a short time an extensor spasm at the knee joint, with extreme supination of the foot. Also known as Leg sign and Pool's phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Schlunge's sign, lack of peristalsis below the seat of intestinal obstruction with dilatation above it. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*)

Schönlein's sign, [Johann Lukas Schönlein, German physician, 1793-1864] purpura rheumatica. Also called Schoenlein's disease. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Schramm's sign, visibility with the cystoscope of a whole or part of the posterior urethra; seen in spinal cord disease. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Schridde's sign, [Hermann Robert August Schridde, German pathologist, 1875—] status thymo-lymphaticus. (*ARPS* 1990) (*Hematologic*) (*Immunology*)

Schüle's sign, [Heinrich Schüle, German psychiatrist, 1839-1916] omega melancholium. Also called Schuele's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Schüller's sign, [Artur Schüller, Austrian neurologist,—1874] in hemiplegia due to organic lesion, the patient walks sideward more easily to the affected side than to the healthy side. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Schültz-Charlton sign, [Werner Schültz, Willy Charlton, German physician,—1889] the Schültz-Charlton reaction phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Schultze's sign, [Franz Chvostek, Austrian surgeon, 1835-1884, Nathan Weiss, Vienna physician, 1851-1883, Friedrich Schultze, German physician, 1848-1934, Bernhard Sigismund Schultze] a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. 2. tongue phenomenon. Also known as Chvostek's sign, Chvostek-Weiss sign, Face sign, and Schultze-Chvostek sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Schultze-Chvostek sign, [Franz Chvostek, Austrian surgeon, 1835-1884, Nathan Weiss, Vienna physician, 1851-1883, Friedrich Schultze, German physician, 1848-1934, Bernhard Sigismund Schultze] a sudden spasm on tapping one side of the face. A sign seen in postoperative tetany. Also known as Chvostek's sign, Chvostek-Weiss sign, Face sign, and Schultze-Chvostek sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Schwartze's sign, a pinkish-red blush color behind the tympanic membrane found in some cases of otosclerosis. (*ARPS* 1990) (*Otolaryngology*)

Schwediauer's sign, [François Xavier Schwediauer, Austrian physician, 1748-1824] Achilles tendon bursitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Scimitar sign, scimitar syndrome, the scimitar shadow produced by the vein of the syndrome on chest radiography. (*ARPS* 1990) (*Cardiovascular*)

Screwdriver Teeth sign, there are depressions or notching of the incisal edges of the labial surfaces of the permanent incisors. A sign of congenital syphilis. Also called Hutchinson's Incisor or Teeth sign. (*TAIMD* 1909) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Scrotal Reflex sign, a slow, vermicular contraction of the dartos muscle obtained by stroking the perineum or by applying a cold object to it. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*)

Scrotal Tongue sign, furrows and grooves on the dorsal surface of the tongue. Also known as fissured tongue. (*ARPS* 1990) (*Oral Maxillofacial*)

Scrub Typhus sign, mite bites followed with severe headache, shivering, and rash. A sign of Scrub Typhus fever, also called Mite fever. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*)

Scythian sign, atrophy of the penis and testicles from sexual perversion. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Seat Rash sign, [IndoChina, c. 19th century] urticarial buttocks lesions on French soildiers, caused by the zoonotic *Strongyloides stercoralis* roundworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Second Nerve sign, clinical test of the optic cranial nerve; can the patient see? (*ARPS* 1990) (*Neurologic*)

Second Set sign, the accelerated and intensified rejection by the recipient of a second graft of tissue from the same donor as a consequence of the primary immune response (i.e., antibody production and cell-mediated immunity) induced by the first graft. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Seeligmuller's sign, [Otto Ludovicicus G. A. Seeligmuller, German neurologist, 1837-1912] mydriasis on the side of the face affected with neuralgia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Oral Maxillofacial*)

Seeping sign, just after birth a seemingly healthy child begins to bleed from the mucous surfaces and from the navel. A sign of syphilis haemorrhagic neonatorum. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Hematologic*)

Segmental Reflex sign, a reflex controlled by a single segment or region of the spinal cord. Also called Regional Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Séguin's sign, [Edouard Séguin, French alienist, 1812-1880] contraction of the muscles preceding an epileptic attack. A sign that gives warning of it's approach. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Seidel's sign, [Erich Seidel, German ophthalmologist, 1882-1948] an extension at either or both ends of an arcuate scotoma. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Seitz's sign, bronchial inspiration which begins harshly and then becomes faint; indicative of a cavity in the lung. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Semilunar sign, when the patient makes a fist, there is characteristic shortening of the middle metacarpal. A sign of fracture-dislocation of the carpal semilunar. (*ARPS* 1990) (*Muscular Skeletal*)

Semon's sign, [Sir Félix Semon, German-English laryngologist, 1849-1921] impairment of the mobility of the vocal cords. A sign seen in malignant disease of the larynx. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Oncology*)

Senile Reflex sign, a gray reflection from the pupil of aged people due to hardening of the lens. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Seoul Fever sign, rapid fever, kidney failure, severe back pain, and bleeding rash which progresses to death in 15 percent of victims. Caused by a zoonotic hantaviral infectious process known as hemorrhagic fever with renal syndrome disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Renal Reproductive*) (*Dermatologic*) (*Death*)

Septic sign, a disease which arises from the development of pyogenic or putrefactive organisms. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Sergent's sign, [Emil Sergent, French physician] the white line draw across the skin with a fingernail lasts three to five minutes in Addison's and low arterial tension. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*) (*Cardiovascular*)

Serpent sign, keratolysis or deciduous skin, a condition in which the whole skin is cast off like a snake in huge contiguous pieces. Also called Preston's sign. (Preston 1881) (Frank 1891) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Serum sign, the symptoms produced by a second injection of a protective serum, the first injection having caused no trouble. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Setting-sun sign, downward deviation of the eyes, so that each iris appears to set beneath the lower lid, with white sclera exposed between it and the upper lid; indicative of intracranial pressure (hemorrhage or meningoependymitis) or irritation of the brain stem (as in kernicterus). (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Seventh Nerve sign, clinical test of the facial cranial nerve; can the patient smile and show their front teeth? (*ARPS* 1990) (*Neurologic*)

Shanghai Rheumatism sign, skin lesions and eosinophilic meningitis caused by the ingestion of snakes, frogs, fish, or poultry infected with the zoonotic *Gnathostoma spinigerum* nematode larvae. Also called gnathostomiasis and chokofishi disease. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Nutritional*) (*Neurologic*)

Shaven Beard sign, Peyer's patches seen post mortem due to typhoid fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Death*)

Sheep Dip sign, severe spreading stomach pain with possibly vomiting black from soot or blue from indigo. Intense thirst, cramps, and coma. Also known as Arsenic sign (acute) and Paris Green sign. (*ARPS* 1990) (*Poisoning*) (*Gastrointestinal*)

Sheep Madness sign, neuropsychiatric changes, encephalitis, and paralysis from exposure to sheep and goat milk. Caused by the zoonotic Central European encephalitis flavivirus. It can be transmitted by *Ixodes* tick bites. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Nutritional*)

Shelly's sign, a sago like eruption on the palate and the lips. A sign seen in influenza. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Sherren's Triangle sign, [James Sherren, English surgeon, 1872-1945] hyperaesthesia of an area of skin indicating acute appendicitis. (Sherren 1905) (*ARPS* 1990) (*Dermatologic*) (*Neurologic*) (*Gastrointestinal*)

Sherrington's sign, [Sir Charles Scott Sherrington, Nobel laureate, English physiologist, 1857-1952] the response of the hind limb musculature on stimulation of a motor nerve which has previously been degenerated. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Shibley's sign, in the presence of consolidation of the lung or a collection of fluid in the pleural cavity, all spoken vowels are heard through the stethoscope as "ah." (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Ship-Fever sign, typhus fever. (*AACM* 1896) (*ARPS* 1990) (*Infectious disease Immunology*)

Short Neck sign, as seen in Klippel-Feil or Turner's syndromes. (*ARPS* 1990) (*Muscular Skeletal*) (*Genetic*)

Shot-silk sign, retina texture phenomenon. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Shrewmouse sign, [L. Dufourmentel, French surgeon] the receding chin and characteristic shrewmouse profile as a sign of pediatric ankylosis of the temporomandibular joint. Also known as sign Dufourmentel's sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*)

Shrinking Dark sign, horrible rapid dehydration associated with a form of cholera in India, in which victims appeared to shrink and their capillaries burst, coloring the skin black and blue. (*ARPS* 1990) (*Infectious disease Immunology*)

Shrunken Skin sign, the lower jaw tremors and whole skin appears shrunken with dark rings under the eyes. A sign of malarial infection with *Plasmodium falciparum.* (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Dermatologic*) (*Ophthalmic*) (*Hematologic*)

Shurygin's sign, (N. A. Shurygin, Russian neurologist) auropupillar reflex. (Shurygin 1901) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*) (*Otolaryngology*)

Shwartzman's sign, [Gergory Shwartzman, Russian bateriologist, 1896-1965] a severe hemorrhagic reaction with necrosis, observed in rabbits which are first injected with 0.25 ml. of typhoid or certain other culture filtrates into the skin of the abdomen and which then twenty-four (eighteen to thirty-two) hours later are injected intravenously

with 0.01 ml. of the same filtrate. The site of the later injection turns blue at the center and red at the periphery, the skin is glossy, smooth, and edematous, the blood vessels below the surface are ruptured and the numerous leukocytes are dead. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Infectious disease Immunology*) (*Dermatologic*)

Siberian sign, North Asian zoonotic tickborne rickettsiosis. Found in the Chinese, Mongolian, and Siberian wild rodent populations. (*ARPS* 1990) (*Infectious disease Immunology*)

Siberian Cirrhosis sign, [Sebastiano Rivolta, Italian scientist, K. N. Vinogradov, Russian scientist] a zoonotic infection that can involve the liver, pancreas, and gall bladder. Caused by the ingestion of undercooked fish containing the *Opisthorchis* fluke. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Nutritional*)

Sicar's sign, a metallic resonance on percussion with two metal coins on the front of the chest and auscultation at the back. A sign observed in some cases of effusion within the pleura. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Sickel Hand sign, pediatric dactylitis as a sign of sickel cell disease. (*ARPS* 1990) (*Hematologic*) (*Muscular Skeletal*)

Siegert's sign, [Ferdinand Siegert, German paediatrician, 1865—, John Langdon Haydon Down, English physician, 1828-1896] in Down syndrome, the little fingers are short and curved inward. (Siegert) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Genetic*)

Sieur's sign, [Celestin Sieur, French surgeon, 1860-1955] a coin is laid against the chest and struck by another coin producing a metallic ringing sound over a cavity filled with air. As seen in pneumothorax. Also known as Coin sign. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Signorelli's sign, [Angelo Signorelli, Italian physician, 1876-1952] extreme tenderness on pressure on the retromandibular point in meningitis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Silex's sign, [Paul Silex, German ophthalmologist, 1858-1929] furrows radiating from the mouth. A sign seen in inherited syphilis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Dermatologic*)

Silver Eye sign, a blue black deposit of silver in the skin, caused by exposure to silver dusts or salts. Often appears as a gray blue haze in the white of the eye. Also known as Argyria sign. (*ARPS* 1990) (*Dermatologic*) (*Ophthalmic*) (*Poisoning*)

Simian Hand sign, wasting of the thenar and hypothenar eminence causing a flat palm. A sign seen in thoracic root and chord lesions, peripheral neuropathy, and dystrophia myotonica. (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Simon's sign, 1. [Charles Edmund Simon, American physician, 1866-1927] retraction or fixation of the umbilicus during inspiration. 2. [John Simon, English surgeon, 1824-1876] absence of the usual correlation between the movements of the diaphragm and thorax; seen in beginning meningitis. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Simonsen's sign, a type of graft-versus-host (GVH) reaction with an immunological basis. The injection of 10- to ll-day-old chick embryos with adult spleen cells, whole blood, or leukocyte concentrates is almost invariably fatal before hatching. Injections of these cells shortly before or after hatching are likewise fatal for many of the hosts. In all cases the principal symptoms are splenomegaly and a severe hemolytic anemia accompanied by lesions in the liver, bone marrow, and other tissues. (Simonsen 1957) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*)

Simple Reflex sign, a reflex involving a single muscle. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Sin Nombre sign, fever, pulmonary failure, and thrombocytopenia which progresses to death in 50 percent of victims. Caused by the zoonotic Sin Nombre virus. The disease process is also called the hantaviral pulmonary syndrome. (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Neurologic*) (*Respiratory*) (*Death*)

Sinbis sign, fever with a rash that can progress to hemorrhagic, as well polyarthritis and muscle pains. Caused by a zoonotic alphavirus spread by the bite of infected mosquitos. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Muscular Skeletal*)

Singer's sign, bilateral enlargement of the external jugular vein as normally seen in singers, but if unilateral may be due to adenoma of the thyroid, neoplasm or a subclavian aneurysm. (*ARPS* 1990) (*Cardiovascular*) (*Otolaryngology*) (*Oncology*)

Sinkler's sign, [Wharton Sinkler, American neurologist, 1847-1910] in an extremity with spastic paralysis, sharp flexion of the toe may be followed by flexion of the knee and hip. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Sisto's sign, [Genero Sisto, Chilean paediatrician,—1923] constant crying as a sign of congenital syphilis in infancy. (*ARPS* 1990) (*Infectious disease Immunology*)

Sixth Nerve sign, clinical test of the abducens cranial nerve; is there internal strabismus? (*ARPS* 1990) (*Neurologic*)

Skeer's sign, a small circle in the iris, near the pupil, in both eyes. A sign seen in tuberculosis meningitis. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Skin Pupillary sign, dilatation of the pupil produced by irritation of the skin of the neck. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Ophthalmic*)

Skin Reflex sign, 1. the act of nipping the platysma myoides contracts the pupil. Also called Platysmal reflex. 2. a reflex which occurs on stimulation of the skin. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*) (*Ophthalmic*)

Skoda's sign, [Jósef Skoda, Austrian physician, 1805-1881] a tympanic sound heard on percussing the chest above a large pleural effusion or above a consolidation in pneumonia. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Infectious disease Immunology*)

Skoptzy sign, a sign of horrific religious castration of both men and women in Russia and Romania, which can include applying fire to the breasts as well as amputation of the breasts. (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*) (*Dermatologic*)

Skunk Boil sign, leptospirosis infection. Also known as Possum sign. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Slate Grey sign, slate grey colouration of the skin secondary to melanin and haemosiderin deposition. A sign of haemochromatosis. (*ARPS* 1990) (*Dermatologic*) (*Hematologic*)

Slow Greek sign, bradycardia, from the Greek root word meaning slow. (*ARPS* 1990) (*Cardiovascular*)

Smirnoff's sign, (B. Smirnoff, French neurologist) sterno-brachial reflex. (Smirnoff 1934) (*ARPS* 1990) (*Muscular Skeletal*)

Smith's sign, [Eustace Smith, British physician, 1835-1914] a murmur heard in cases of enlarged bronchial glands on auscultation over the manubrium with the patient's head thrown back. Also known as Eustace Smith's sign. (Smith) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Smith's Teeth sign, [Nathan Smith, American physician, 1762-1829] The teeth are often incrusted with a brownish matter, which adheres to them closely near the gums. A sign indicating typhous fever. (Smith 1824) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Smith's Tongue sign, [Nathan Smith, American physician, 1762-1829] The tongue in the commencement of this fever is covered with a white fur, which as the disease advances assumes a yellow tinge, and from that gradually changes to a brown, which eventually becomes almost black. Arrived at this state, it cracks and peels off, leaving the tongue smooth, dry and very red. It is then again renewed and again comes off, making these changes, in severe cases, several times in the course of the disease. A sign indicating typhous fever. (Smith 1824) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Snake sign, [Howard Atwood Kelly, American surgeon, 1858-1943] if the ureter is teased with an artery forceps, it will contract like a snake or worm. Also known as Kelly's sign. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Snellen's Eye sign, [Hermann Snellen, Dutch ophthalmologist, 1834-1908] the bruit heard with a stethoscope over the closed eye in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Snellen's Ear sign, [Hermann Snellen, Dutch ophthalmologist, 1834-1908] unilateral congestion of the ear upon stimulation of the distal end of the divided auriculocervical nerve. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Snuff Box sign, [Alan Herapath Todd, British surgeon, Franklin Bennett McCarty, American surgeon] swelling in the anatomical snuff-box as an indication of fracture of the carpal scaphoid. (*ARPS* 1990) (*Muscular Skeletal*)

Sodoku sign, Japanese rat bite fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Sole Reflex sign, irritation of the sole contracts the toes. Also called Plantar reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Solovieff's sign, rhythmic spasm of the left half of the diaphragm. A sign seen in tetanus. Also known as Phrenic and Diaphragm phenomenon. (*TAIMD* 1909) (*ARPS* 1990) (*Respiratory*) (*Neurologic*) (*Infectious disease Immunology*)

Somagyi's sign, widening of the pupils on deep inspiration and their contraction on expiration; said to indicate irritable weakness or instability of the cardiac vagus. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Cardiovascular*) (*Neurologic*) (*Respiratory*)

Somatic sign, any sign presented by the trunk and limbs rather than by the sensory apparatus. (*TAIMD* 1909) (*ARPS* 1990)

Somatointestinal sign, inhibition of intestinal motility when the skin over the abdomen is stimulated. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Gastrointestinal*)

Sonnenburg's sign, [Georges Hayem, French physician, 1841-1933, Eduard Sonnenburg, German surgeon, 1848-1915] sanguineous leucocytosis observed in appendicitis accompanied with periotinitis. Also known as Hayem's sign. (Hayem 1872) (Sonnenburg 1891) (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*)

Sorrel Salt sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear white or brown and stains clothing brown or orange. A sign of poisoning with oxalic acid. Also known as Lemon Salt sign and Oxalic sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Poisoning*)

Soto-Hall sign, with the patient flat on his back, on flexion of the spine beginning at the neck and going downward, pain will be felt at the site of the lesion in back abnormalities. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Souques' sign, [Alexandre Achille Souques, French neurologist, 1860-1944] 1. when the patient seated in a chair is suddenly thrown back, the lower extremities do not extend normally or otherwise attempt to counteract the loss of balance; it indicates advanced striatal disease. 2. a phenomenon seen in incomplete hemiplegia, consisting of involuntary extension and separation of the fingers when the arm is raised. Also known as Finger phenomenon or sign and Souque's phenomenon. (Souques) (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Spade-like Hands sign, [Condict Walker Cutler, Jr., American surgeon] acromegaly. (*ARPS* 1990) (*Muscular Skeletal*) (*Endocrine*)

Spalding's sign, in the x-ray film of the fetus in utero, overriding of the bones of the vault of the skull indicates death of the fetus. Also known as Horner's sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*) (*Death*)

Spanish Fly sign, violent pain in the abdomen, purging blood, incessant desire to pass urine and only a little urine or blood passed, delirium. A sign of poisoning with cantharides. (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*) (*Neurologic*) (*Poisoning*)

Spargana sign, nodular, cystic skin lesions that may be inflamed and itchy, can have eye and CNS involvement. Caused by exposure to cat or dog faeces containing eggs from

the zoonotic *Spirometra* tapeworm. These pseudophyllidean cestodes can have many hosts including monkeys, snakes, frogs, pigs, and weasels. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Speaking in Tongues sign, spontaneous babbling of nonsense, often accompanied by flailing of the arms, jerky movements, and falling to the floor sometimes with loss of consciousness. Associated with hypoglycemia, diabetic ketoacidosis, and *delirium tremens* exacerbated by exhaustion. (*ARPS* 1990) (*Endocrine*) (*Nutritional*) (*Neurologic*)

Spedalskhed sign, leprosy. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Spider sign, the spider angioma of liver cirrhosis. (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*) (*Dermatologic*) (*Cardiovascular*)

Spiegelberg's sign, a feeling like that of friction against wet India rubber conveyed to the finger by a cervix uteri. A sign that the cervix is affected with malignant disease. (Spiegelberg 1871) (*TAIMD* 1909) (*ARPS* 1990) (*Renal Reproductive*) (*Oncology*)

Spina Ventosa sign, tuberculous dactylitis. (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Spinal sign, tonic contraction of the spinal muscles on the diseased side in pleurisy. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Respiratory*)

Spinal Reflex sign, any reflex whose arc is connected, with a center in the spinal cord. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Spine sign, disinclination to flex the spine anteriorly on account of pain; seen in poliomyelitis. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Splashing sign, splashing sounds made with palpation over the stomach, when the stomach should normally be empty, at least three hours after a meal. A sign that suggests dilation of the stomach due to pyloric obstruction. (*ARPS* 1990) (*Gastrointestinal*)

Spoon Nail sign, [Henry Stanley Plummer, American physician, 1874-1937, Porter Paisley Vinson, American physician] spoon-shaped finger nails, dysphagia, and glossitis. A sign of Plummer-Vinson syndrome, iron deficiency anaemia, and hepatic disease. Also called koilonychia. (*ARPS* 1990) (*Hematologic*) (*Oral Maxillofacial*) (*Dermatologic*) (*Gastrointestinal*)

Springlike sign, [André Antoine Henri Thomas, French physician, 1867-1963] during the finger to nose test, the patient is directed to raise his arm over his head and then ordered to let it drop to his head, if the arm rebounds, this is a sign of disease of the cerebellum. Also called André Thomas sign. (Thomas 1900) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Square Root sign, the abnormally quick rise in right ventricular pressure associated with pericarditis. (*ARPS* 1990) (*Cardiovascular*)

Squire's sign, alternate contraction and dilatation of the pupil, indicative of basilar meningitis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*) (*Neurologic*)

Stairs sign, difficulty in descending a stairway. A sign found with locomotor ataxia or tabes dorsalis. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Stalk sign, vesicular eruptive disease occurring in oxen. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Stammers' sign, [Francis Alan Roland Stammers, British surgeon] the ulcer of a pre-auricular sinus. (*ARPS* 1990) (*Dermatologic*) (*Otolaryngology*)

Stargardt's sign, (Karl Bruno Stargardt, German ophthalmologist, 1875-1927) juvenile macular degeneration. (*ARPS* 1990) (*Ophthalmic*) (*Genetic*)

Startle Reflex sign, on placing an infant on a table and then forcibly striking the table on either side of the child, the arms are suddenly thrown out in an embrace attitude; called also Moro's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Statotomic sign, those reflexes having to do with the position of the body; called also Attitudinal Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Staub-Traugott sign, [Hans Staub, Swiss internist,—1890, Carl Traugott, German internist,—1885] after a glucose load is administered, subsequent loads, given after a short interval, are disposed of at an accelerated rate. (*IMD* 1974) (*ARPS* 1990) (*Endocrine*)

Steinhausen's sign, ichthyosis, morbid development of the papillae and thickening of the epidermic lamellae. Also called Porcupine sign. (Steinhausen 1831) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Stellwag's sign, [Carl Stellwag von Carion, Austrian ophthalmologist, 1823-1904] retraction of the upper eyelids producing apparent widening of the palpebral opening with which is associated infrequent and incomplete blinking. A sign seen in exophthalmic goiter. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Ophthalmic*) (*Endocrine*)

Stendhal sign, altered mental status usually associated with visiting museums. An indication of Stendhal syndrome which victims suffer from dizziness, tachycardia, and hallucinations when exposed to a large amount of art in a short period of time. (*ARPS* 1990) (*Neurologic*)

Sterbe sign, a disease of horses in South Africa. A serum prepared from horses affected with this disease is said to be curative of malarial poisoning. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Poisoning*) (*Hematologic*)

Sterles' sign, increased pulsation over the cardiac region in intrathoracic tumors. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Oncology*)

Sterling-Okuniewski sign, the patient is unable to put out his tongue when directed to do so, considered to be symptomatic of louse-borne typhus fever. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Sternberg's sign, sensitiveness to palpation of the muscles of the shoulder girdle in pleurisy. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Respiratory*)

Stevenson's sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] double consciousness, dual personality. Also known as Jekyll and Hyde phenomenon, and as it is called by the Germans, *doppelwahrnehmungen*. Named after Robert Louis Stevenson, 1850-1894. (Mitchell) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Stewart-Holmes sign, [Purves Stewart, English physician, 1869-1949, Gordon Holmes, British Neurologist] rebound phenomenon. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Sticker's sign, [G. Sticker, German physician, 1860—] erythema infectiosum. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Stierlin's sign, [Eduard Stierlin, German surgeon, 1878-1919] absence of normal x-ray shadows following a contrast meal demonstrating tuberculosis of the cecum and ascending colon. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Infectious disease Immunology*)

Stiff sign, bovine ephemeral fever caused by an arthopod-borne rhabdovirus. Mortality can approach 30 percent. Also called Three-day sign, Stiffsickness sign, and Dragon Boat sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Stiffsickness sign, bovine ephemeral fever caused by an arthopod-borne rhabdovirus. Mortality can approach 30 percent. Also called Three-day sign, Stiff sign, and Dragon Boat sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Still's sign, [Sir George Frederick Still, English physician, 1868-1941] a variety of chronic polyarthritis affecting children and marked by enlargement of lymph-nodes, generally of the spleen, and irregular fever. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Stiller's sign, [Berthold Stiller, Hungarian physician, 1837-1922] detachment or loose attachment of the tenth rib to the costal cartilages. Preternatural mobility or fluctuation of the tenth rib in enteroptosis or gastroptosis. Suggestive of a tendency to neurasthenia. (Stiller 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Stimson's sign, a transverse line of conjunctival inflammation, sharply demarcated along the eyelid margin, occurring in the prodromal stage of measles. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Stocker's sign, in typhoid fever, if the bed clothes are pulled down, the patient takes no notice; but in tuberculous meningitis the patient resents the interference and immediately draws the clothes up again. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Stokes's sign, [William Stokes, Irish physician, 1804-1878] a severe throbbing in the abdomen, at the right of the umbilicus. A sign seen in acute enteritis. (*TAIMD* 1909) (*TAPMD* 1919) (*ARPS* 1990) (*Gastrointestinal*)

Stokes-Adams sign, [William Stokes, Irish physician, 1804-1878, Robert Adams, Irish physician, 1791-1875] an affection marked by slow pulse, attacks of vertigo, and epileptoid or apoplectoid seizures, probably due to arteriosclerosis of vertebral and basilar arteries. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Stokes's Throat sign, [William Stokes, Irish physician, 1804-1878] exophthalmic goiter. (*TAIMD* 1909) (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Stonecutter's colic, poisoning from work exposure to lead used to fix the ends of balustrades. (*ARPS* 1990) (*Gastrointestinal*) (*Poisoning*)

Stookey's sign, [Byron Polk Stookey, American neurosurgeon,—1887] with the leg semiflexed at the knee, the tendons of the semimembranosus and the semitendinosus muscles are tapped: flexion of the leg results. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Straus' sign, [Isidore Straus, French physician, 1854-1896] the injection of pilocarpine in facial paralysis due to a central lesion does not cause any difference in the perspiration of the two sides; but if the paralysis be of peripheral origin, the secretion of the paralyzed side is markedly affected. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Oral Maxillofacial*)

Strauss' sign, [Hermann Strauss, German physician, 1868-1944] increase of fat following the use of fatty foods in chylous ascites. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*)

Strawberry Cream sign, the color and thickness of blood in profound lipemia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*)

Strawberry Tongue sign, the surface of the tongue is coated with a thick white fur, through which protrude bright scarlet red papillae. A sign indicating scarlet fever. Also known as White Strawberry Tongue. (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Stretch Reflex sign, reflex contraction of a muscle in response to passive longitudinal stretching; called also Liddel and Sherrington Reflex sign and Myotatic Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

String sign, 1. a thin stringlike shadow in the roentgenogram of the colon through the filling defect; seen in colitis and regional ileitis. Also known as Kantor's sign. 2. the stringing out of tubules, observed on pulling the tissues of an intact testis or one in which there is active spermatogenesis, a phenomenon which is prevented by the fibrosis and hyalinization about the tubules when the testis is atrophic. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*)

String of Beads sign, 1. the string of beads appearance of trapped air in the small intestine on abdominal radiography. 2. The string of beads appearance of aneurysms in angiography. (*ARPS* 1990) (*Gastrointestinal*) (*Cardiovascular*)

Structural sign, any disease in which there are microscopic changes. (*TAIMD* 1909) (*ARPS* 1990)

Strümpell's sign, [Adolf von Strümpell, German physician, 1853-1925] 1. dorsal flexion of the foot when the thigh is drawn up toward the body; seen in spastic paralysis of the

lower limb. Called also Tibialis sign. 2. inability to close the fist without marked dorsal extension of the wrist; called also Radialis sign. 3. Pronation sign: passive flexion of the forearm caused by pronation; seen in hemiplegia. Also called Struempell's disease and acute poliencephalitis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Strümpell's Reflex sign, [Adolf von Strümpell, German physician, 1853-1925] leg movement with adduction of the foot produced by stroking the thigh or abdomen. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Strunsky's sign, [Max Strunsky, American surgeon, 1873—] a sign for detecting lesions of the anterior arch of the foot. The examiner grasps the toes and flexes them suddenly. This procedure is painless in the normal foot, but causes pain if there is inflammation of the anterior arch. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Strychnine sign, feeling of suffocation, tetanic convulsions with arched back and blueness of the face, accompanied by raised eyebrows and an evil open grin, called *risus sardonicas*. A sign indicating poisoning with strychnine. This presentation is similar to signs of a tetanus infection caused by the anaerobic bacterium *Clostridium tetani*, an important differential is the time between infection and showing the first signs in tetanus is at least five days, whereas strychnine poisoning shows signs ten to twenty minutes after exposure. Also known as Nux Vomica sign after the evergreen tree it is derived from named *Strychnos nux vomica.* (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*) (*Poisoning*) (*Neurologic*) (*Muscular Skeletal*)

Strychnine High Step sign, an abnormal high stepping gait seen in strychnine poisoning. Also seen in some neurasthenic states. (*ARPS* 1990) (*Poisoning*) (*Neurologic*)

Stupid sign, a differential sign used to distinguish between scarlet fever and measles. The patient looks heavy and stupid with measles, which contrasts markedly with scarlet fever, where the eyes are bright and the general appearance of the patient is one of intelligence. (*ARPS* 1990) (*Infectious disease Immunology*)

Subjective sign, one which is apparent only to the patient, such as pain or vertigo. (*TAIMD* 1909) (*ARPS* 1990)

Sucking Reflex sign, sucking movements of the mouth elicited by the touching of an object to an infant's lips. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Sucking Wound sign, a thoracic sucking wound indicates the pleura has been opened. (*ARPS* 1990) (*Respiratory*)

Sugar sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] the presence of sugar in the vagina. Based on the belief that placing granulated sugar in the birth canal will lure the baby out, because of enticing it with something sweet, thus easing a difficult birth. (*ARPS* 1990) (*Renal Reproductive*)

Suis sign, endocarditis, arthritis, and fever. A zoonotic *Brucella* disease found in wild boars, feral pigs, and swine. (*ARPS* 1990) (*Infectious disease Immunology*)

Suker's sign, deficient complementary fixation in lateral eye rotation; seen in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Sulphuric sign, burning pains in mouth and throat with vomit containing white lumps of mucous and altered brown or black blood. Stains on skin and mucous membranes appear bright white, brown or black and stains clothing brown. A sign of sulphuric acid poisoning. (*ARPS* 1990) (*Dermatologic*) (*Gastrointestinal*) (*Oral Maxillofacial*) (*Poisoning*)

Sulzberger-Chase sign, immunological unresponsiveness to chemical synthesizing agents (haptens) normally capable of inducing delayed-type hypersensitivity; induced by oral administration of the hapten, it results in decreased reactivity to that hapten when it is administered as an antigen, as when conjugated to its protein carrier. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Summer sign, characterized by several of the following abnormalities: lack of sweat and sebaceous glands, distress in warm weather, total or partial anodontia, defective hair, and saddle-type nose. Signs of ectodermal dysplasia, an X-linked recessive trait. (*ARPS* 1990) (*Dermatologic*) (*Otolaryngology*) (*Oral Maxillofacial*) (*Genetic*)

Sumner's sign, [F. W. Sumner, British surgeon] on gentle palpation of the iliac fossa, a slight increase in tonus of the abdominal muscles indicates appendicitis, stone in the ureter or kidney, or a twisted pedicle of an ovarian cyst. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Muscular Skeletal*) (*Gastrointestinal*)

Superficial sign, any reflex provoked by a superficial stimulation. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Supinator Longus Reflex sign, tapping of the tendon of the supinator longus produces flexion of the forearm. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Supraorbital sign, contraction of the orbicularis oculi muscle on tapping the supraorbital nerve. Also known as McCarthy's Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Ophthalmic*)

Suprapatellar sign, with the leg extended the index finger of the examiner is crooked above the patella and is struck; the result is a kick-back of the patella. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Suprapubic sign, stroking the abdomen above Poupart's ligament causes deviation of the linea alba toward the side that is stroked. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Dermatologic*)

Supraumbilical sign, epigastric reflex. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Dermatologic*) (*Gastrointestinal*)

Suzhou sign, [Anhui Province, China] abdominal pain and diarrhea, from the ingestion of oribatid mites containing the zoonotic *Bertiella* tapeworms. These mites are associated with monkey contact. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Swallowing Reflex sign, stimulation of the palate causes swallowing. Also called Palatal Reflex sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Swediaur's sign, [François Xavier Swediaur, Austrian physician, 1748-1824] inflammation of the calcaneal bursa. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Sweet Placental sign, if the placenta has a sweet odor, there is a possible infection with *Clostridium* or *Listeria* bacteria. See Fecal Placental sign. (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

Swinging Flashlight sign, [Robert Marcus Gunn, English ophthalmologist, 1850-1909] with the patient's eyes fixed at a distance and a strong light shining before the intact eye, a crisp bilateral contraction of the pupil is noted. On moving the light to the affected eye, both pupils dilate for a short period. Then on return of the light to the intact eye, both pupils contract promptly and remain contracted. Indicative of minimal damage to the optic nerve. Also known as Marcus Gunn's Pupillary sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Swoon sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] hematophobia, a horror of blood, often progressing to unconsciousness. This sign is not found among savages. (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

System-disease sign, one which affects a particular nerve-tract or system of nerve-fibers. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*)

Tabby-cat sign, tigroid striation of the fatty degenerated heart muscle. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Taijin sign, [Jean Baptiste Edouard Gelineau, French neurologist, 1859—] anthropophobia, fear of society and interpersonal relations. In Japan it has been described as the sufferers may have a fear of offending people. (Beard) (Mitchell) (Baillarger) (Gelineau 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Talma's sign, [Sape Talma, Dutch physician, 1847-1918] myotonia acquisita. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tam O'shanter sign, the cranium presents with an appearance like a round woollen cap, with a flat top. A sign of cranio-cleido-dysostosis. (*ARPS* 1990) (*Oral Maxillofacial*) (*Muscular Skeletal*) (*Genetic*)

Tana sign, [Kenya and Zaire] papulovesicular pox-type lesions on arms and legs with fever. Caused by the zoonotic tanapox virus which lives in Asian and African monkey colonies. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Tanna sign, the people of Tanna produce evelated scars on their arms and chests. This is a sign of cosmetic mutilation. (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Tapetal Light Reflex sign, the glowing of eyes in the dark, just as do the eyes of carnivorous animals. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Tapir Mouth sign, facioscapulohumeral muscular atrophy. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tarabagan sign, an epizootic disease affecting marmots (*tarabagans*) in Mongolia. The disease resembles Bubonic plague, and is highly infective to man. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Tarantism sign, a mania which is supposed to originate with the bite of a tarantula, but is actually a sign of ergot poisoning, which appeared at the same time as Saint With's sign. (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Poisoning*)

Target sign, [Albert Mason Stevens, American paediatrician, 1884-1945, Frank Chambliss Johnson, American paediatrician, 1894-1934] characteristic target lesions of the skin and erythema of the iris. Seen in erythema multiforme and Stevens-Johnson syndrome. (*ARPS* 1990) (*Dermatologic*)

Tarnier's sign, [Etienne Stephene Tarnier, French obstetrician, 1828-1897] effacement of the angle between the upper and lower uterine segments in pregnancy. A sign indicating the inevitable approach of an abortion. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Tarsophalangeal Reflex sign, dorsal flexion of the second and third or second and fifth toes on tapping the dorsum of the foot in the region of the cuboid or external cuneiform bone: said to indicate some central organic lesion of the motor nervous system. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Dermatologic*) (*Muscular Skeletal*)

Taxidermist's sign, physical and emotional problems caused by exposure to arsenic and mercury used to protect stuffed animals from pests. (*ARPS* 1990) (*Neurologic*) (*Poisoning*)

Tay's sign, [Warren Tay, English physician, 1843-1927] a cherry-red spot seen through the fovea centralis of the eye, in late infantile amaurotic familial idiocy. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Tea sign, tea colored urine, myoglobinuria, indicating muscle death. (*ARPS* 1990) (*Muscular Skeletal*) (*Renal Reproductive*)

Tear sign, continuous weeping, clothing smells of pear drops, indicating exposure to ethyl iodoacetate tear gas. (*ARPS* 1990) (*Ophthalmic*) (*Poisoning*)

Tear Fall sign, on the affected side in facial paralysis, the eye contains a tear which does not fall. (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Tellais' sign, pigmentation of the eyelid in Graves' disease. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Dermatologic*)

Tendo Achilles sign, contraction of the calf muscles excited by a blow upon the Achilles tendon producing a flexion of the foot. Also called the Tendo Achilles reflex. (*TAIMD* 1909) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Tendon-reflex sign, a deep reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Tennis Elbow sign, tenderness of the lateral epicondyle and the antecubital fossa, and pain with pronation of the forearm. (*ARPS* 1990) (*Muscular Skeletal*)

Tenth Nerve sign, clinical test of the vagus cranial nerve; can the patient swallow and the larynx is drawn up with normal equal force? (*ARPS* 1990) (*Neurologic*)

Testivin's sign, the formation of a condition like pellicle on the urine after removing the albumin and treating with acid and then one third volume of ether. A sign said to occur during the incubation of infectious diseases. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

Texas sign, fever, splenic enlargement, and hemoglobinuria in cattle. Caused by protozoan tick transmission. Also called Redwater fever. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

The Horrors sign, *delirium tremens*, associated with alcohol withdrawal, also called Rum Fits sign and The Shakes sign. (*ARPS* 1990) (*Neurologic*)

The Jumpers sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

The Shakes sign, *delirium tremens*, associated with alcohol withdrawal, also called The Horrors sign and Rum Fits sign. (*ARPS* 1990) (*Neurologic*)

The Twitchers sign, [Georges Gilles de la Tourette, French physician, 1857-1904] the tic-convulsif of Tourette. (Crichton 1829) (Beard 1880) (Gray 1894) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*)

Thebes sign, [Gorgidas, Greek military leader, c. 378 BC] an act of femininity, when a man removes hair from his torso, increasing femininity for attractiveness. A practice associated with homosexuality. (*ARPS* 1990) (Ludwig) (*Dermatologic*)

Theimich's Lip sign, a protrusion or pouting of the lips elicited by tapping the orbicularis oris muscle. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Theobald Smith's sign, [Theobald Smith, American pathologist, 1859-1934] guinea pigs which have been used for standardizing diphtheria antitoxin and have thus been injected with a small dose of blood serum become highly susceptible to the serum and may die very promptly if given a rather large second dose of the same serum a few weeks later. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Thermic sign, spasm of muscles and hyperesthesia produced by applying heat or cold; seen in tetany. Also known as Kashida's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Thick Tongue sign, [White, American surgeon] thickening of the tongue, an early sign found in leprosy. Also usually the patient's upper incisor teeth are very loose or have already fallen out. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Oral Maxillofacial*)

Third Nerve sign, clinical test of the oculomotor cranial nerve; is there reaction of pupils and movement of the eyelids? (*ARPS* 1990) (*Neurologic*)

Thomas' sign, [Hugh Owen Thomas, English surgeon, 1834-1891] 1. flexion of the hip joint can be compensated by lordosis. 2. pinching of the trapezius muscle causes goose flesh above the level of a spinal cord lesion. (Thomas 1900) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Thominxosis sign, cough, fever, bronchospasm associated with a zoonotic lungworm nematode. Known hosts are a wide range of carnivorous mammals, including cats, sables, foxes, and bears. Also called pulmonary capillariasis after the roundworm *Capillaria aerophila*. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*)

Thomsen's sign, [Oluf Thomsen, Danish physician, 1878-1940] the *in vivo* or *in vitro* polyagglutinability of red cells by all normal human sera as a result of activation by a bacterial enzyme of a latent T receptor common to all erythrocytes. Called also Huebener-Thomsen-Friedenreich sign. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Thomsen's Spasm sign, [Asmus Julius Thomas Thomsen, Danish physician, 1815-1896] a disease usually congenital and hereditary, characterized by tonic spasm and rigidity of certain muscles when an attempt is made to move them after a period of rest or when mechanically stimulated. The stiffness disappears as the muscles are used. Called also *myotonia congenita*. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Genetic*)

Thomson's sign, [Frederick Holland Thomson, British physician, 1867-1938, C. Pastia, Romanian physician] hemorrhagic lines appearing in body creases, as in the antecubital fossae. inguinal areas, and the wrists, during scarlet fever; they are visible at the onset of the rash and persist after its desquamation. Also known as Pastia's sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Hematologic*) (*Infectious disease Immunology*)

Thoracic Inlet sign, enlarged veins over the thoracic inlet as a sign of retro sternal goitre. (*ARPS* 1990) (*Otolaryngology*) (*Endocrine*) (*Cardiovascular*)

Thornton's sign, [Knowsley Thornton, British physician, 1845-1904] severe pain in the region of the flanks in nephrolithiasis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Thornwaldt's sign, [Gustav Ludwig Tornwaldt, 1843-1910] a form of bursitis. Also called Tornwaldt's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Threat Reflex sign, sudden closure of the eyes at a sign of danger. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Three sign, on radiography of the aorta there appears to be a pair of bulges indicating coarctation. Also known as E sign, Reversed Three sign and Figure Three sign. (*ARPS* 1990) (*Cardiovascular*)

Three-day sign, bovine ephemeral fever caused by an arthopod-borne rhabdovirus. Mortality can approach 30 percent. Also called Stiff sign, Stiffsickness sign, and Dragon Boat sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Throckmorton's sign, [Thomas Bentley Throckmorton, American neurologist,—1885] a variation of the Babinski reflex elicited by percussion of the metatarsophalangeal region in the dorsum of the foot. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Thyroglossal sign, large fluctuant midline swelling in the anterior aspect of the neck. As seen with the thyroglossal duct cyst. (*ARPS* 1990) (*Otolaryngology*)

Thyroid sign, when a patient swallows, a swollen thyroid will move upwards. (*ARPS* 1990) (*Otolaryngology*) (*Oral Maxillofacial*) (*Endocrine*)

Tibialis sign, [Adolf von Strümpell, German physician, 1853-1925] dorsal flexion of the foot when the thigh is drawn up toward the body; seen in spastic paralysis of the lower limb. Called also Strümpell's sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tibioadductor sign, tapping of the tibia on the inner side of the leg results either in homolateral adduction of the leg or crossed adduction from side to side. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tigretier sign, a mania associated with ergot poisoning, see Dancing Madness sign. (Hecker 1859) (*AACM* 1896) (*ARPS* 1990) (*Neurologic*) (*Nutritional*) (*Poisoning*)

Tillaux' sign, [Paul Jules Tillaux, French surgeon, 1834-1904] the presence of a resonant area between the pubic bone and a tumor is indicative of a tumor being mesenteric. (Tillaux) (*ARPS* 1990) (*Oncology*) (*Muscular Skeletal*)

Tinel's sign, [Jules Tinel, French neurologist, 1879-1952] a tingling sensation in the distal end of a limb when percussion is made over the site of a divided nerve. It

indicates a partial lesion or the beginning regeneration of the nerve. Also known as Distal Tingling on Percussion sign, D.T.P. sign, and Formication sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Tissue Paper sign, the circular tissue paper scar of a healed gumma, evidence of a previous syphilitic infection. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Toe sign, [Joseph François Félix Babinski, French neurologist, 1857-1932] extension of the toes on stimulation of the sole of the foot. A sign seen in certain morbid conditions. Also known as Toe phenomenon. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Toe Reflex sign, strong flexion of the great toe flexes all the muscles of the lower extremity. It is seen in pathologic states in which there is increased knee-jerk. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Toma's sign, tympany on the right side in inflammatory conditions of the peritoneum. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Renal Reproductive*)

Tomaselli's sign, quinine poisoning with marked hemoglobinuria. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Hematologic*) (*Poisoning*)

Tommasi's sign, [L. Tommasi, Italian physician] alopecia on the posteroexternal aspect of the legs, found almost exclusively in men with gout. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Dermatologic*)

Tongue sign, [Friedrich Schultze, German physician, 1848-1934] a slight blow upon the tongue produces a contraction with the appearance of deep depressions; seen in tetany. Also called Schultze's sign. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Tongue Tie sign, an abnormally broad or short lingual frenum that is attached close to the tip of the tongue. (*ARPS* 1990) (*Oral Maxillofacial*)

Tonic sign, the passing of an appreciable period of time after the occurrence of a reflex before relaxation; a reflex which maintains the reflex contractions that are the basis of posture and attitude. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tonic Neck sign, a reflex in the newborn consisting of extension of the arm and sometimes of the leg on the side to which the head is forcibly turned, with flexion of the contralateral limbs. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Tooth-cough sign, reflex cough due to a dental infection. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Oral Maxillofacial*) (*Infectious disease Immunology*)

Tooth-rash sign, strophulus. Also called red gum colic. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Oral Maxillofacial*)

Tooth-spasms sign, infantile eclampsia. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Tophi sign, the conformation of the pinna in gouty subjects. (*ARPS* 1990) (*Otolaryngology*) (*Renal Reproductive*)

Tori sign, hyperostosis occuring in the midline of the hard palate, called *torus palatinus* or hyperostosis located on the lingual aspect of the mandible, termed *torus mandibularis*. (*ARPS* 1990) (*Oral Maxillofacial*)

Tornwaldt's sign, [Gustav Ludwig Tornwaldt, 1843-1910] a form of bursitis. Also called Thornwaldt's sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Tourette's sign, [Georges Gilles de la Tourette, French physician, 1857-1904] a nervous disease marked by incoordination, speech disorders, and convulsions. (*Neurologic*) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Tournay's sign, unilateral dilatation of the pupil of the abducting eye on extreme lateral fixation. Also known as Gianelli's sign. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

TPE sign, tropical pulmonary eosinophilia, also originally called pseudo-tuberculous condition due to a zoonotic filarial parasite. Signs are severe dyspnea, easinophilia, and mottling seen on chest radiography. Also known as occult filariasis. (*ARPS* 1990) (*Infectious disease Immunology*) (*Respiratory*) (*Hematologic*)

Tracheal Lifting sign, [White, American surgeon] on swallowing there is a feeling that the trachea is higher in the throat than normal, this raised sensation is associated with delayed clearing of the gastrointestinal tract. (*ARPS* 1990) (*Otolaryngology*) (*Gastrointestinal*)

Trained sign, one that does not occur naturally in the animal but that may be developed by regular association of some physiological function with an unrelated outside event, such as ringing of a bell or flashing of a light. Soon the physiological function starts whenever the outside event occurs. Also known as conditioned reflex. (Pavlov 1911) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Tramp Stamp sign, tattoos on women that are not religious or ceremonially required for their culture. Often on the lower back area; they were originally used to signify a life of prostitution. This practice continues today but sometimes these tattoos are now seen in the

non-prostitute population, as sign of admiration for the romanticized prostitution lifestyle which is linked to drug abuse, physical violence, and sexually transmitted diseases. The origin of the term dates from the 17th century Yakuza practice of tattooing prostitutes on the back. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Traube's sign, [Ludwig Traube, German physician, 1818-1876] a faint double sound heard in auscultation over the femoral arteries. A sign of aortic insufficiency or regurgitation and sometimes mitral stenosis. Also known as Traube's phenomenon. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Trench Mouth sign, [Henri Vincent, French physician, 1862-1950] painful, acute necrotizing ulcerative gingivitis, also known as ulceromembranous gingivitis, Vincent's infection, Vincent's War sign, and ANUG sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Trendelenburg's sign, [Friedrich Trendelenburg, German surgeon, 1844-1924] positional leg tests for varicosity and valve incompetence, as well as, positional standing tests observing the rising gluteal fold as seen in poliomyelitis, fracture of the femoral head, coxa vara, and congenital dislocations. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*) (*Cardiovascular*)

Trepidation sign, patellar clonus. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*)

Tresilian's sign, [Frederick James Tresilian, English physician, 1862-1926] a reddish appearance in Stensen's duct in mumps. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Triceps sign, extension of the forearm on tapping of the triceps tendon at the elbow while the forearm hangs limp at right angles to the arm. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Triceps Surae sign, plantar flexion of the foot elicited by a tap on the Achilles tendon preferably while the patient kneels on a bed or chair, the feet hanging free over the edge; ankle jerk. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Tricuspid sign, disease of the tricuspid valves. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*)

Trigeminus sign, stimulation of the cornea or of the eyelid results in dilatation of the ipsilateral and the contralateral pupil. Also known as Oculopupillary Reflex sign and Oculosensory Cell Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Trimadeau's sign, if the dilatation above an esophageal stricture is conic, the stricture is fibrous; if cup shaped, the stricture is malignant. (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Gastrointestinal*)

Triple E sign, severe encephalitis with seizures caused by the bite of a mosquito that carries the zoonotic Eastern equine encephalomyelitis alphavirus. Hosts are horses, donkeys, mules, chickens, and wild turkeys. Has been researched for use as a biological weapon. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*)

Troisier's sign, [Charles Emile Troisier, French physician, 1844-1919] enlargement of the lymph glands above the clavicle. A sign of intra-abdominal malignant disease or retrosternal tumor. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Gastrointestinal*)

Trombone sign, [Valentin Jacques Joseph Magnan, French psychiatrist, 1835-1916] involuntary movement of the tongue back and forth out of the mouth, seen in paralysis of the insane. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Oral Maxillofacial*)

Tromner's sign, [Johann Hoffman, German neurologist, 1857-1919, Ernest L. O. Tromner, German neurologist, 1868—] 1. an increased mechanic irritability of the sensory nerves. A sign of tetany. 2. a sudden nipping of the nail of the index, middle, or ring finger produces flexion of the terminal phalanx of the thumb and of the second and third phalanx of some other finger; called also digital reflex, Hoffmann's reflex and sign. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Trousseau's sign, [Armand Trousseau, French physician, 1801-1867] muscular spasm on pressure over large detached arteries or nerves. A sign seen in tetany and rickets. Also known as Trousseau's phenomenon and when tetany is present a contraction of the hand known as obstetrician's hand is seen. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Nutritional*)

Trousseau's Vomit sign, stomachal vertigo. (*TAIMD* 1909) (*ARPS* 1990) (*Gastrointestinal*) (*Neurologic*)

Tsutsugamushi sign, a disease endemic in certain parts of Japan, and transmitted by the bite of a mite. Called also Japanese river fever, Flood fever, Island fever, Kedani disease, Akamuchi disease, Shimanushi disease, *Yochubio,* and *Shashitsu.* (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*)

Tuberculous Ulcer sign, an ulcer that is characterized by undermined edges and is usually painful. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Tumor Albus sign, wasting of the quadriceps in cases of tuberculosis of the knee. Also called white swelling. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Tunga Eye sign, a skin boil that has the resemblance of a small eye. It can have a 10mm white area with a black center. The black center is the abdomen's caudal tip of the parasitic chigoe flea that has burrowed into the skin to lay eggs. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Turner's sign, [George Grey Turner, English surgeon, 1877-1951] discoloration (bruising) of the skin of the loin in acute hemorrhagic pancreatitis. Also known as Grey Turner's sign. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Gastrointestinal*) (*Hematologic*)

Turning sign, incoordination, constant spinning, coma, and death seen in cattle. Theileriasis caused by *Theileria parva* attacking the nervous system. (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Turyn's sign, [Félix Turyn, Polish physician, 1899—] in sciatica, if the patient's great toe is bent dorsally, pain will be felt in the gluteal region. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Twelfth Nerve sign, clinical test of the hypoglossal cranial nerve; can the patient stick out their tongue? (*ARPS* 1990) (*Neurologic*)

Twort-d'Herelle sign, [Frederick William Twort, British bacteriologist, 1877-1950, Felix Hubert d'Herelle, French bacteriologist, 1873-1949] the phenomenon of transmissible bacterial lysis; bacteriophagia. When to a broth culture of typhoid or dysentery bacilli there is added a drop of filtered broth emulsion of the stool from a convalescent typhoid or dysentery patient, complete lysis of the bacterial culture will occur in a few hours. If a drop of this lysed culture is added to another culture of the bacilli, lysis will take place exactly as in the first. A drop of this culture will then dissolve a third culture, and so on through hundreds of transfers. d'Herelle attributes this phenomenon to the action of an ultramicroscopic parasite of bacteria which he named the *bacteriophage.* (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Typhus sign, a rash that spreads from the armpits to the chest, abdomen, and thighs. A sign of Typhus. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Uhthoff's sign, [Wilhelm Uhthoff, German ophthalmologist, 1853-1927] nystagmus occurring in multiple cerebrospinal sclerosis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Ukrainian Black Tongue sign, [c. 1771, Moscow] Bubonic plague. (*ARPS* 1990) (*Infectious disease Immunology*)

Ulcerative Colitis Stool sign, the blood stained mucus clings to the bed pan. (*ARPS* 1990) (*Gastrointestinal*) (*Hematologic*)

Ulnar Leprosy sign, thickening of the ulnar nerve at the elbow. A sign of tuberculoid leprosy. Also known as Elbow sign. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Muscular Skeletal*)

Ulnar Reflex sign, tapping of the styloid process of the ulna results in pronation of the hand. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Unconditioned Reflex sign, a fixed reflex whose mechanism may be supposed to be inherited as its functioning does not depend on previous experience. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Genetic*)

Unschuld's sign, [Paul Unschuld, German internist] a tendency to cramp in the calves of the legs. An early sign indicating diabetes. Also called Unschald's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Endocrine*)

Uremia Tongue sign, the tongue is dry in cases of uremia. (*ARPS* 1990) (*Renal Reproductive*) (*Oral Maxillofacial*)

Urinary Reflex sign, any of the reflexes of the bladder necessary for effortless evacuation of urine and subconscious maintenance of continence: vesical contraction following distention of the bladder, vesical contraction evoked by urethral flow, vesical contraction evoked by proximal urethral distention, relaxation of the urethra resulting from running liquid in the urethra, distention of the bladder resulting in relaxation of the external sphincter, relaxation of the proximal urethral smooth muscle by distention of the bladder, and vesical contraction related to running liquid through the urethra. Also known as Bladder Reflex sign. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Uriolla's sign, the presence in the urine of malarial patients of minute black granules of blood pigment. (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Renal Reproductive*) (*Infectious disease Immunology*)

Vaccinoid sign, a slight cutaneous reaction to vaccination in a person partially immune to smallpox. (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Vagabond's sign, [Edward Headlam Greenhow, English physician, 1814-1888] 1. parasitic melanoderma; discoloration of the skin in persons of filthy habits, caused by the irritation of

lice. 2. a pigmentary process from an itching disease like prurigo and pityriasis stimulating *morbus addisonii*, particularly found in vagrants and tramps. Also called Vagrant's disease and sign. (Greenhow) (Thibierge) (*AACM* 1896) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Endocrine*)

Vagrant's sign, parasitic melanoderma; discoloration of the skin in persons of filthy habits, caused by the irritation of lice. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Vagus Reflex sign, abnormal sensitiveness to pressure over the course of the vagus nerve. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Valley Fever sign, zoonotic fungal coccidioidomycosis. (*ARPS* 1990) (*Infectious disease Immunology*)

Vampire's sign, [Vlad Dracul, 15th century] severe mutilating skin lesions caused by photosensitivity, neurological disruptions, liver pathology, and strange purple urine. These are indications of forms of porphyria. It is now suggested that Vlad Dracul the 15th century slayer prince, also known as Vlad the Impaler suffered from hereditary porphyria. There is supporting evidence that some sufferers craved blood due to iron deficiency. Coupled with the fact that the disease can be manifested with painful cutaneous photosensitivity, allowing some victims to only come out after dark caused them to be sadly mistaken for vampires. Also called Dracula's sign. (*ARPS* 1990) (*Dermatologic*) (*Genetic*) (*Renal Reproductive*) (*Gastrointestinal*)

Vanzetti's sign, [Tito Vanzetti, Italian surgeon, 1809-1888] in sciatica the pelvis is always horizontal in spite of scoliosis, but in other lesions with scoliosis the pelvis is inclined. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Vaquez's sign, [Louis Henri Vaquez, French physician, 1860-1936] chronic polycythemia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Vascular sign, constriction of an artery produced by peripheral irritation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Vasopressor sign, rise in pressure from reflex vasoconstriction. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Vedder's sign, [Edward Bright Vedder, 1878-1952] slight pressure on muscles of calf causes pain; ascertain the presence of anesthesia with a pin over anterior surface of leg; note any changes in patellar reflexes; when patient squats upon heels, note the inability

to rise without use of hands. Also known as Beriberi sign. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*) (*Nutritional*)

Vein sign, a bluish cord along the midaxillary line formed by the swollen junction of the thoracic and superficial epigastric vein; seen in tuberculosis of the bronchial glands and in superior vena cava obstruction. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Cardiovascular*)

Veld sign, [South Africa, 1830] rickettsial heartwater disease in ruminants. Also called Veldt sickness. (*ARPS* 1990) (*Infectious disease Immunology*) (*Cardiovascular*)

Venezuelan Headache sign, [South America] slight flu symptoms that progress in 20 percent of the cases to fatal encephalitis. Caused by the mosquito-borne zoonotic Venezuelan equine encephalitis alphavirus. (*ARPS* 1990) (*Infectious disease Immunology*) (*Neurologic*) (*Death*)

Verdigris sign, free flow of saliva, bluish or greenish vomited material, strong coppery taste. A sign of poisoning with copper salts. Also known as Salivation sign. (*ARPS* 1990) (*Oral Maxillofacial*) (*Gastrointestinal*) (*Poisoning*)

Veronal sign, lips and finger-tips blue, drooping of eyelids, and usually loss of control of bladder and bowels. An indication of barbitonum poisoning. Also known as Barbitonum sign. (*ARPS* 1990) (*Poisoning*) (*Oral Maxillofacial*) (*Ophthalmic*) (*Renal Reproductive*) (*Gastrointestinal*)

Vertebra Prominens sign, pressure upon the last cervical vertebra of an animal reduces the tone of all four limbs. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Vesical Reflex sign, desire to urinate produced by moderate distention of the bladder. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Vesicointestinal sign, inhibition of intestinal motility due to irritation of the bladder. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*) (*Gastrointestinal*)

Vigouroux's sign, [Jean Marie Charcot, French physician, 1825-1893, August Vigouroux, French neurologist] diminished electric resistance of the skin for galvanic current. A sign of exophthalmic goiter. Also known as Charcot-Vigouroux's sign. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Dermatologic*) (*Otolaryngology*) (*Endocrine*) (*Ophthalmic*)

Vincent's sign, [Douglas Moray Cooper Lamb Argyll Robertson, Scottish physician, 1837-1909, Henri Vincent, French physician, 1862-1950] a pupil which is miotic

and responds to accommodation effort, however it does not respond to light. Also known as Argyll Robertson's sign or pupil. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Vincent's War sign, [Henri Vincent, French physician, 1862-1950] painful, acute necrotizing ulcerative gingivitis, also known as ulceromembranous gingivitis, and Trench Mouth sign. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Oral Maxillofacial*)

Violet Sweat sign, chromidrosis, perspiration with a violet color. (Paullini 1706) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Vipond's sign, [Vipond, French physician] adenopathy occurring during the incubation of childhood diseases. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*)

Virchow's sign, [Rudolf Ludwig Karl Virchow, German pathologist, 1821-1902] palpable left supraclavicular lymph node indicating gastrointestinal neoplasm. (*ARPS* 1990) (*Gastrointestinal*) (*Oncology*)

Virchow's Face sign, [Rudolf Ludwig Karl Virchow, German pathologist, 1821-1902] leontiasis ossium. (*Infectious disease Immunology*) (*Muscular Skeletal*) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990)

Viri1e Reflex sign, [Charles Hamilton Hughes, American neurologist, 1839-1916] a tap on the dorsum of the penis retracts the bulbocavernous portion. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Renal Reproductive*)

Visceral Reflex sign, that in which the stimulus is set up by some state of an internal organ. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Viscerocardiac sign, reflex alteration in cardiac rhythm or contractility caused by visceral excitation. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Cardiovascular*)

Visceromotor sign, contraction of abdominal muscles (abdominal rigidity) over a diseased viscus. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Viscerosensory sign, a region of sensitiveness to pressure on some part of the body due to disease of some internal organ. (*IMD* 1974) (*ARPS* 1990) (*Neurologic*)

Viscerotrophic sign, degeneration of any peripheral tissue as a result of chronic inflammation of any of the viscera. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Vital signs, the pulse, respiration and temperature. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Voided Fetus sign, the discharge of fetal remains thru the bladder. (White 1878) (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*)

Volkmann's sign, [Richard von Volkmann, German surgeon, 1830-1889] ischemic contracture of an extremity, when arterial blood supply is impaired. Can cause the claw hand deformity when the forearm is involved. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Muscular Skeletal*)

Volkmann's Foot sign, [Richard von Volkmann, German surgeon, 1830-1889] a congenital deformity of the foot due to a tibiotarsal dislocation. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*)

Voltolini's sign, [Frederic Edward Rudolf Voltolini, German otolaryngologist, 1819-1889, Jean Garel, French physician] on electric trans-illumination of the oral cavity, there is an absence of light-perception presenting as an infraorbital shadow on the affected side of the antrum of Highmore. A sign of diseases of the antrum of Highmore, including empyema and tumor. Also known as Burger's sign, Heryng's sign and Garel's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oncology*) (*Oral Maxillofacial*)

Voltolini's Ear sign, [Frederic Edward Rudolf Voltolini, German otolaryngologist, 1819-1889] an acute purulent inflammation of the internal ear, with violent pain, followed by fever, delirium, and unconsciousness. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*) (*Neurologic*)

Von Graefe's sign, [Albrecht von Graefe, German ophthalmologist, 1828-1870] failure of the upper lid to move downward with the eyeball in glancing downward. A sign seen in exophthalmic goiter. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Otolaryngology*)

Von Jaksch's sign, [Rudolf von Jaksch, Czech physician, 1855-1947] pseudoleukemic anemia of infants, due to disease of the spleen and lymphatic glands. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*)

Von Mering's sign, relaxation of overlying abdominal muscles following ingestion of food. (*IMD* 1974) (*ARPS* 1990) (*Gastrointestinal*) (*Muscular Skeletal*) (*Nutritional*)

Wahl's sign, [Eduard von Wahl, German surgeon, 1833-1890] 1. local meteorism or distension on the proximal side of an obstruction of the bowl. 2. a blowing or

scraping sound at the systole, heard over an artery soon after its partial division by an injury. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*) (*Cardiovascular*)

Walcheren sign, malarial fever in Holland. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Walton's sign, [Sir James Walton, English surgeon] differential fluctuation signs of adenomata of the thyroid. The solid adenomata will feel cystic and the cystic adenomata will feel solid. (*ARPS* 1990) (*Endocrine*) (*Otolaryngology*)

Wardrop's sign, [James Wardrop, English surgeon, 1782-1869] onychia maligna. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Wartenberg's sign, [Robert Wartenberg, American neurologist, 1887-1956] 1. a sign of ulnar palsy, consisting of a position of abduction assumed by the little finger. 2. reduction or absence of the pendulum movements of the arm in walking; seen in patients with cerebellar disease. (Wartenberg) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Warthin's sign, exaggerated pulmonary sounds in cases of acute pericarditis. (Warthin 1896) (*TAIMD* 1909) (*ARPS* 1990) (*Cardiovascular*) (*Respiratory*)

Water Lilly sign, the radiological appearance of a collapsed hydatid cyst caused by the zoonotic *Echinococcus* tapeworm. (*ARPS* 1990) (*Infectious disease Immunology*)

Watered-silk sign, a peculiar appearance, like that of watered silk, visible upon the retinas of children. Also called Water-silk reflex. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Wax Doll sign, [Geoffrey Marshall, British physician] bagginess of the eyelids and bloated facies that give the patient an appearance of a wax doll. A sign of myxoedema. Also known as Marshall's sign. (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*) (*Oral Maxillofacial*)

Weber's sign, [Sir Hermann David Weber, British physician, 1823-1918] paralysis of the oculomotor nerve of one side and hemiplegia of the opposite side. (*TAIMD* 1909) (*TAPMD* 1919) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Neurologic*)

Wedensky's sign, on applying a series of rapidly repeated stimuli to a nerve, the muscle contracts quickly in response to the first stimulus and then fails to respond further; but if the stimuli are applied to the nerve at a slower rate, the muscle responds to all of them. (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Wegener's sign, [Friedrich Wegener, German pathologist, 1907-1990] invasive granulomatous lesion destroying the bridge of the nose and affecting the sinuses. (*ARPS* 1990) (*Otolaryngology*) (*Dermatologic*) (*Oral Maxillofacial*)

Wegner's sign, [Friedrich Rudolf Georg Wegner, German pathologist, 1843-1917] a broadened, discolored appearance of the epiphysial line in infants dying from hereditary syphilis. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Muscular Skeletal*) (*Infectious disease Immunology*)

Weil's sign, [Adolf Weil, German physician, 1848-1916] severe leptospirosis; also called Fiedler's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Weill's sign, [Edmond Weill, French paediatrician, 1858-1924] absence of expansion in the subclavicular region of the affected side in infantile pneumonia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*)

Weir-Mitchell's sign, [Silas Weir Mitchell, American neurologist, 1829-1914] erythromelalgia. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Weiss's sign, [Nathan Weiss, Austrian physician, 1851-1883] contraction of the facial muscles when lightly percussed. A sign that occurs in hysteria, neurasthenia and tetany. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Neurologic*)

Weiss's Myopic sign, [Leopold Weiss, Austrian ophthalmologist, 1848-1901] a curved reflex seen with the ophthalmoscope on the fundus of the eye to the nasal side of the disk; believed to be indicative of myopia. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*)

Well's sign, an acute infectious disease characterized by jaundice, fever, muscular pain, and enlargement of the liver and spleen. The symptoms last from ten days to two weeks and recovery is usually uneventful. (*TAIMD* 1909) (*ARPS* 1990) (*Infectious disease Immunology*) (*Hematologic*) (*Gastrointestinal*)

Wenckebach's sign, [Karel Frederik Wenkebach, Dutch internist, 1864-1940] the generation of impulses by the sinus node of the heart at a constant rate while the P-R interval grows progressively longer during several beats until an atrial complex is not followed by a ventricular complex. (*IMD* 1974) (*ARPS* 1990) (*Cardiovascular*)

Werewolf sign, individuals are completely covered in hair except for their palms and soles. A sign of congenital hypertrichosis lanuginosa. (*ARPS* 1990) (*Dermatologic*) (*Genetic*)

Werlhof's sign, [Paul Gottlieb Werlhof, German physician, 1699-1767] purpura haemorrhagica. Also known as Werlhoff's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Hematologic*) (*Dermatologic*)

Wernicke's sign, [Karl Wernicke, German neurologist, 1848-1905] the hemiopic pupillary reaction. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Wesselsbron sign, muscle pain, fever, super sensitive skin with possible maculopapular rash. Caused by the mosquito-borne zoonotic Wesselsbron fever flavivirus. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*) (*Muscular Skeletal*)

West Nile sign, fever and rash, with respiratory and flaccid paresis caused by brain swelling. Caused by the zoonotic West Nile fever flavivirus. Can be mosquito or food borne, and has also been associated with transplants of fluids and tissues. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*) (*Neurologic*) (*Respiratory*)

Westberg's sign, [Fredrich Westberg, German physician] white spot disease, morphea alba. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Westermark's sign, transient clearing (avascularity) of the normal radiologic shadow of pulmonary tissue distal to a pulmonary embolism. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Westphal's sign, [Carl Friedrich Otto Westphal, German neurologist, 1833-1890] the loss of the knee jerk in locomotor ataxia. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Westphal-Piltz sign, [Jan Piltz, Polish neurologist, 1870-1930, Alexander Karl Otto Westphal, Austrian neurologist, 1863-1941] Westphal-Piltz phenomenon. Also called Pilcz's sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Westphal-Piltz Reflex sign, [Jan Piltz, Polish neurologist, 1870-1930, Alexander Karl Otto Westphal, Austrian neurologist, 1863-1941] contraction of the pupil associated with closure or attempted closure of the eye. Also called Westphal's Pupillary Reflex sign, Pilcz's phenomenon, and Orbicularis Reflex sign. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Westphal's Pupillary Reflex sign, [Jan Piltz, Polish neurologist, 1870-1930, Alexander Karl Otto Westphal, Austrian neurologist, 1863-1941] contraction of the pupil associated with closure or attempted closure of the eye; called also Orbicularis Reflex sign.

(*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Ophthalmic*)

Wet Leaves sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] the odor of *Mycobacteruim tuberculosis*. (*ARPS* 1990) (*Infectious disease Immunology*)

Wever-Bray sign, alternating action potentials in the trunk of the acoustic nerve, corresponding to auditory stimuli impinging on the corresponding cochlea. (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Whale's Flipper sign, obliteration of the concavity of the palm, which makes the large hand look like a whale's flipper. A sign of middle palmar space infections. (*ARPS* 1990) (*Infectious disease Immunology*)

White Butterfly sign, [White, American surgeon] when chest radiography demonstrates the presence of an ominous white butterfly pattern. A sign indicating that the lungs have exploded, usually associated with the concussion from a bomb. Also known as White's Butterfly Phenomenon. (*ARPS* 1990) (*Respiratory*) (*Death*)

White Hairy Tongue sign, the tongue and oral mucous membranes are covered in a white fur or plaque. An indication of an oropharyngeal infection with *Candida albicans*. (*ARPS* 1990) (*Oral Maxillofacial*)

White Leprosy sign, leukoderma, a pathologic process with the result of a deficiency in the normal pigmentation of the skin. Also know by many colloquial appellations in the Indian subcontinent as *sufaid-korh*, *chumba*, *phoolyrce*, *buras*, *cabbore*, *kuttam*, and leopard pattern. (Bissell) (Woods) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

White Ouron sign, chyluria from purulent cystitis. (*AACM* 1896) (*ARPS* 1990) (*Renal Reproductive*) (*Infectious disease Immunology*)

White's sign, [F. A. White, American surgeon] the triad of facial palsy, nystagmus, and facial paresthesia gradually increasing over several days as an occult sign of basilar skull fracture of the temporal bone, without pathognomonic postauricular ecchymosis, cerebrospinal fluid otorrhea, cerebrospinal fluid rhinorrhea, or inner ear haemorrhage. The finding is due to secondary neurapraxia of the VII, VI, and V cranial nerves. The sign is pathognomonic of a longitudinal fracture of the temporal bone whereas transverse fractures involve the labyrinth and the VIII cranial nerve resulting in neural hearing loss, as well spontaneous nystagmus. Also called White's Triad. (*ARPS* 1990) (*Oral Maxillofacial*) (*Otolaryngology*) (*Ophthalmic*) (*Neurologic*) (*Muscular Skeletal*) (*Infectious disease Immunology*)

White's Skin sign, [James C. White, American dermatologist] keratosis follicularis. (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*)

White-spot sign, degeneration of the papillary and reticular layers of the skin marked by the formation of white bead-like spots; morphea guttata. (*TAIMD* 1909) (*ARPS* 1990) (*Dermatologic*)

Whytt's sign, [Robert Whytt, Scottish physician, 1714-1766] hydrocephalus internus, basilar meningitis caused by tuberculous. (*TAIMD* 1909) (*IMD* 1974) (*ARPS* 1990) (*Neurologic*) (*Infectious disease Immunology*)

Widmer's sign, the temperature is higher in the right axilla than the left, in appendicitis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Gastrointestinal*)

Widowitz's sign, protrusion of the eyeballs and sluggish movements of the eyeballs and eyelids seen in diphtheritic paralysis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Ophthalmic*)

Wild Turkey sign, bloody diarrhea associated with the ingestion of wild game turkey that has eaten ants infected with the eggs of the zoonotic *Raillietina* tapeworm. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Gastrointestinal*)

Wilder's sign, [William Hamlin Wilder, American ophthalmologist, 1860-1935] an early sign of Graves' disease consisting in a slight twitch of the eyeball when it changes its movement from adduction to abduction or vice versa. (*IMD* 1974) (*ARPS* 1990) (*Ophthalmic*) (*Endocrine*)

Wilk's sign, [Sir Samuel Wilks, English physician, 1824-1911] chronic parenchymatous nephritis. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*)

Willan's sign, [Robert Willan, English physician, 1757-1812] psoriasis circinata. Also called Willan's lepra. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Willan's Cheek sign, [Robert Willan, English physician, 1757-1812] lupus vulgaris of the cheek. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Willard's sign, lupus vulgaris. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Williams's sign, [Charles J. B. Williams, English physician, 1805-1889] 1. a dull tympanitic resonance heard in the second intercostal space. A sign in severe pleural

effusion. 2. lessened lung expansion on the affected side. A sign of adherent pericardium. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Williams' Phenomenon sign, [Charles J. B. Williams, English physician, 1805-1889] the tympanic note of skodaic resonance in pleuritis with effusion varies in pitch with the opening and closing of the patient's mouth. (*IMD* 1974) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Williamson's sign, [Oliver K. Williamson, English physician] markedly diminished blood pressure in the leg as compared with that in the arm on the same side; seen in pneumothorax and pleural effusion. (*IMD* 1974) (*ARPS* 1990) (*Respiratory*) (*Cardiovascular*)

Willis's sign, diabetes. (*TAIMD* 1909) (*ARPS* 1990) (*Endocrine*)

Wilson's sign, [Sir William James Erasmus Wilson, English dermatologist, 1809-1884] dermatitis exfoliativa. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Dermatologic*)

Wimberger's sign, erosion of the upper end of the tibia in early syphilis. (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Muscular Skeletal*)

Winckel's sign, [Franz Karl Ludwig Wilhelm von Winckel, German gynecologist, 1837-1911] an extremely fatal disease of newborn infants, characterized by icterus, hemorrhage, bloody urine, and cyanosis. See Winkel's sign. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Hematologic*) (*Death*)

Windsheid's sign, a neurotic syndrome condition caused by arteriosclerosis. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Cardiovascular*) (*Neurologic*)

Wine Sweat sign, perspiration with the taste of wine. (Bartholinus 1654) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*)

Winkel's sign, [Franz Karl Ludwig Wilhelm von Winckel, German gynecologist, 1837-1911] hematogenous icterus with cyanosis and hemoglobinuria. Also called Winckel's sign. (*AACM* 1896) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Renal Reproductive*) (*Hematologic*) (*Gastrointestinal*)

Winterbottom's sign, [Thomas Masterman Winterbottom, English physician, 1765-1859] enlargement of posterior cervical lymph nodes in African trypanosomiasis. (*APMD*

1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*) (*Otolaryngology*)

Wintrich's sign, [Anton Wintrich, German physician, 1812-1882] a change in the pitch of the percussion note when the mouth is opened and closed. A sign that indicates a cavity in the lung. (*TAIMD* 1909) (*TAPMD* 1919) (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Respiratory*)

Witch-milk sign, colostrum secreted from the mammary of newborns. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Endocrine*)

Woakes's sign, [Edward Woakes, English physician, 1837-1912] sneezing due to the caking of cerumen in the ear causing irritation of the auricular branch of the vagus. Also called Ear-Sneezing sign. (Woakes 1880) (*AACM* 1896) (*ARPS* 1990) (*Otolaryngology*) (*Neurologic*)

Woillez's sign, [Eugene Joseph Woillez, French physician, 1811-1882] acute idiopathic congestion of the lung. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Respiratory*)

Woltman's sign (Henry William Woltman, American physician, 1889-1964) the deep tendon reflex is slow to recovery, an indication of myxedema. (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*) (*Endocrine*)

Wood's sign, relaxation of the orbicularis muscle, fixation of the eyeball, and divergent strabismus, indicative of profound anesthesia. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*) (*Ophthalmic*) (*Neurologic*)

Wool-sorters' sign, a form of anthrax attacking those who handle wool. (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Infectious disease Immunology*)

Worm sign, [Howard Atwood Kelly, American surgeon, 1858-1943] if the ureter is teased with an artery forceps, it will contract like a snake or worm. Also known as Kelly's sign. (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*)

Wreden's sign, [Robert Robertovich Wreden, Russian otologist, 1837-1893] presence of a gelatinous matter in the external auditory meatus in children who are born dead. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Renal Reproductive*) (*Otolaryngology*) (*Death*)

Wrist sign, loss of pulse at the wrist, an indication of cholera. (*ARPS* 1990) (*Cardiovascular*) (*Infectious disease Immunology*)

Wrist-clonus sign, extreme extension of the hand causes a local jerking movement. (*TAIMD* 1909) (*ARPS* 1990) (*Neurologic*) (*Muscular Skeletal*)

Xenical sign, steatorrhea associated with Orlistat. (*ARPS* 1990) (*Nutritional*) (*Gastrointestinal*)

Yaba sign, [Africa] large hard benign skin lesions that are painful, caused by the zoonotic yabapox virus found in monkeys. These lesions often occur on the face and hairless areas. (*ARPS* 1990) (*Infectious disease Immunology*) (*Dermatologic*)

Yak Swelling sign, painless skin swellings sometimes with ocular and neurologic complications, caused by the ingestion of tapeworm eggs in faeces. Also called coenuriasis and bladderworm disease from the zoonotic *Taenia* cestodes. (*ARPS* 1990) (*Infectious disease Immunology*) (*Nutritional*) (*Dermatologic*)

Yawning sign, yawning often has been associated with taking antidepressants. (*ARPS* 1990) (*Neurologic*)

Yellow Legs sign, [Mikhail Afanasievich Bulgakov, Russian physician, 1891-1940] indolent ulcers on yellow legs; a presentation of syphilis. (*ARPS* 1990) (*Dermatologic*) (*Infectious disease Immunology*)

Yellow Jack sign, mouth feels swollen, bloodshot eyes, bradycardia, black vomit and kidney pain. A sign indicating yellow fever. Caused by the zoonotic mosquito-borne yellow fever virus. Baboons and monkeys are known hosts. Mortality can be as high as 50 percent. (*ARPS* 1990) (*Infectious disease Immunology*) (*Gastrointestinal*) (*Renal Reproductive*) (*Oral Maxillofacial*) (*Ophthalmic*) (*Death*)

Yellow Water sign, animal urine in water can transmit zoonotic leptospirosis, causing fever, liver and kidney failure, as well death. Also referred to as yellow water-yellow skin in reference to the jaundice. (*ARPS* 1990) (*Infectious disease Immunology*) (*Death*)

Yemen sign, bilharzia parasite infection from ablution pools in mosques. Also known as Ablution sign. (*ARPS* 1990) (*Infectious disease Immunology*)

Yoruba sign, scars on the cheeks, a sign of ceremonial tribal markings by the Yoruba of Africa. (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Yuman sign, several blue lines on the chin. A sign of ceremonial tattooing in Mojave and Apaches-Yumas natives. (Bourke) (*AACM* 1896) (*ARPS* 1990) (*Dermatologic*) (*Oral Maxillofacial*)

Zaufal's sign, [Emanuel Zaufal, Czechoslovakian rhinologist, 1833-1910] saddle nose. (*APMD* 1920) (*DIMD* 1921) (*IMD* 1974) (*ARPS* 1990) (*Otolaryngology*)

Ziehen-Oppenheim sign, [Georg Theodore Ziehen, H. Oppenheim, German neurologist, 1858—] dystonia musculorum deformans. (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990) (*Muscular Skeletal*) (*Neurologic*)

Zone sign, in precipitation reactions, three zones may appear in the supernatant: a zone of antibody excess, in which uncombined antibody is present; a zone of equivalence, in which both antigen and antibody are completely precipitated and no uncombined antigen or antibody is present; and a zone of antigen excess, in which all antibody has combined with antigen and additional uncombined antigen is present (in this zone, precipitation is partly or completely inhibited because, in the presence of excess antigen, soluble antigen-antibody complexes form). (*IMD* 1974) (*ARPS* 1990) (*Infectious disease Immunology*)

Zygomatic sign, lateral motion of the lower jaw to the percussed side on percussion over the zygoma. (*IMD* 1974) (*ARPS* 1990) (*Oral Maxillofacial*)

Zymotic sign, a disease due to the action of a ferment, as of a morbific germ or a ptomain. (*Infectious disease Immunology*) (*TAIMD* 1909) (*APMD* 1920) (*DIMD* 1921) (*ARPS* 1990)

SECTION TWO

Thaumatographia Medica

This *thaumatographia medica* is an arrangement of the most important cases found in medical literature. In this situation, these phenomenal selections span some five hundred years of history and establish the ultimate collection of extraordinary papers in medicine, surgery and the scientific method. Each of the landmark works is prefaced by a micro-biography which is by design brief. The selections are organized by the date they were released. The research on these revolutionary theories and findings revealed many of these papers were first read by the physician themself, often in front of enemies and rivals acting as peers. It must have taken a brave individual to appear before these huge annual scientific meetings and face the harsh and intense criticism directed towards them. If it were not for the selflessness and determination of these pioneers, many of these important discoveries would still be unknown today.

JOURNEYS IN DIVERSE PLACES

Ambroise Paré

This is an excerpted version a collection of the works by Ambroise Paré (1510-1590) the French military surgeon and the official royal surgeon for kings Henry II, Francis II, Charles IX, and Henry III of France. He introduced the ligature of arteries to be used during amputation, which is a major contribution to surgery. His works were published in Paris during 1575 and underwent many translations into Latin, German, Dutch, and Russian. An early English translation in 1665 was by Thomas Johnson. This translation and the one by Stephen Paget from Vol. XXXVIII, Part 2. The Harvard Classics. New York: P.F. Collier & Son, 1909 14. were used here. (White 2009)

Ambroise Paré was born in the village of Bourg-Hersent, near Laval, in Maine, France, about 1510. He was trained as a barber-surgeon at a time when a barber-surgeon was inferior to a surgeon, and the professions of surgeon and physician were kept apart by the law of the Church that forbade a physician to shed blood. Under whom he served his apprenticeship is unknown, but by 1533 he was in Paris, where he received an appointment as house surgeon at the Hôtel Dieu. After three or four years of valuable experience in this hospital, he set up in private practice in Paris, but for the next thirty years he was there only in the intervals of peace; the rest of the time he followed the army. He became a master barber-surgeon in 1541.

In Paré's time the armies of Europe were not regularly equipped with a medical service. The great nobles were accompanied by their private physicians; the common soldiers doctored themselves, or used the services of barber-surgeons and quacks who accompanied the army as adventurers. When Paré joined the army, says Paget, he went simply as a follower of Colonel Montejan, having neither rank, recognition, nor regular payment. His fees make up in romance for their irregularity: a cask of wine, fifty double ducats and a horse, a diamond, a collection of crowns and half-crowns from the ranks, other 'honorable presents and of great value'; from the King himself, three hundred crowns, and a promise he would never let him be in want; another diamond, this time from the finger of a duchess: and a soldier once offered a bag of gold to him.

When Paré was a man of seventy, the Dean of the Faculty of Medicine in Paris made an attack on him on account of his use of the ligature instead of cauterizing after amputation. In answer, Paré appealed to his successful experience, and narrated the

Journeys in Diverse Places here printed. This entertaining volume gives a vivid picture, not merely of the condition of surgery in the sixteenth century, but of the military life of the time; and reveals incidentally a personality of remarkable vigor and charm. Paré's own achievements are recorded with modest satisfaction: I dressed him, and God healed him, is the refrain. Paré died in Paris in December, 1590.

The Journey to Turin. 1537

I WILL here shew my readers the towns and places where I found a way to learn the art of surgery: for the better instruction of the young surgeon.

And first, in the year 1536, the great King Francis sent a large army to Turin, to recover the towns and castles that had been taken by the Marquis de Guast, Lieutenant-General of the Emperor. M. the Constable, then Grand Master, was Lieutenant-General of the army, and M. de Montejan was Colonel-General of the infantry, whose surgeon I was at this time. A great part of the army being come to the Pass of Suze, we found the enemy occupying it; and they had made forts and trenches, so that we had to fight to dislodge them and drive them out. And there were many killed and wounded on both sides, but the enemy were forced to give way and retreat into the castle, which was captured, part of it, by Captain Le Rat, who was posted on a little hill with some of his soldiers, whence they fired straight on the enemy. He received an arquebusshot in his right ankle, and fell to the ground at once, and then said, Now they have got the Rat. I dressed him, and God healed him.

We entered pell-mell into the city, and passed over the dead bodies, and some not yet dead, hearing them cry under our horses' feet; and they made my heart ache to hear them. And truly I repented I had left Paris to see such a pitiful spectacle. Being come into the city, I entered into a stable, thinking to lodge my own and my man's horse, and found four dead soldiers, and three propped against the wall, their features all changed, and they neither saw, heard, nor spake, and their clothes were still smouldering where the gun-powder had burned them. As I was looking at them with pity, there came an old soldier who asked me if there were any way to cure them. I said no. And then he went up to them and cut their throats, gently, and without ill will toward them. Seeing this great cruelty, I told him he was a villain: he answered he prayed God, when he should be in such a plight, he might find someone to do the same for him, that he should not linger in misery.

To come back to my story, the enemies were called on to surrender, which they did, and left the city with only their lives saved, and the white stick in their hands; and most of them went off to the Château de Villane, where about two hundred Spaniards were stationed. M. the Constable would not leave these behind him, wishing to clear the road for our own men. The castle is seated on a small hill; which gave great confidence to those within, that we could not bring our artillery to bear upon them. They were summoned to surrender, or they would be cut in pieces: they answered that they would not, saying they were as good and faithful servants of the Emperor, as M. the Constable could be of the King his master. Thereupon our men by night hoisted up two great

cannons, with the help of the Swiss soldiers and the lansquenets; but as ill luck would have it, when the cannons were in position, a gunner stupidly set fire to a bag full of gunpowder, whereby he was burned, with ten or twelve soldiers; and the flame of the powder discovered our artillery, so that all night long those within the castle fired their arquebuses at the place where they had caught sight of the cannons, and many of our men were killed and wounded. Next day, early in the morning, the attack was begun, and we soon made a breach in their wall. Then they demanded a parley: but it was too late, for meanwhile our French infantry, seeing them taken by surprise, mounted the breach, and cut them all in pieces, save one very fair young girl of Piedmont, whom a great seigneur would have. The captain and the ensign were taken alive, but soon afterward hanged and strangled on the battlements of the gate of the city, to give example and fear to the Emperor's soldiers, not to be so rash and mad as to wish to hold such places against so great an army.

The soldiers within the castle, seeing our men come on them with great fury, did all they could to defend themselves, and killed and wounded many of our soldiers with pikes, arquebuses, and stones, whereby the surgeons had all their work cut out for them. Now I was at this time a fresh-water soldier; I had not yet seen wounds made by gunshot at the first dressing. It is true I had read in John de Vigo, first book, *Of Wounds in General,* eighth chapter, that wounds made by firearms partake of venenosity, by reason of the powder; and for their cure he bids you cauterise them with oil of elder, scalding hot, mixed with a little treacle. And to make no mistake, before I would use the said oil, knowing this was to bring great pain to the patient, I asked first before I applied it, what the other surgeons did for the first dressing; which was to put the said oil, boiling well, into the wounds, with tents and setons; wherefore I took courage to do as they did. At last my oil ran short, and I was forced instead thereof to apply a digestive made of the yolks of eggs, oil of roses, and turpentine. In the night I could not sleep in quiet, fearing some default in not cauterising, that I should find the wounded to whom I had not used the said oil dead from the poison of their wounds; which made me rise very early to visit them, where beyond my expectation I found that those to whom I had applied my digestive medicament had but little pain, and their wounds without inflammation or swelling, having rested fairly well that night; the others, to whom the boiling oil was used, I found feverish, with great pain and swelling about the edges of their wounds. Then I resolved never more to burn thus cruelly poor men with gunshot wounds.

While I was at Turin, I found a surgeon famed above all others for his treatment of gunshot wounds; into whose favour I found means to insinuate myself, to have the recipe of his balm, as he called it, wherewith he dressed gunshot wounds. And he made me pay my court to him for two years, before I could possibly draw the recipe from him. In the end, thanks to my gifts and presents, he gave it to me; which was to boil, in oil of lilies, young whelps just born, and earth-worms prepared with Venetian turpentine. Then I was joyful, and my heart made glad that I had understood his remedy, which was like that which I had obtained by chance.

See how I learned to treat gunshot wounds; not by books.

My Lord Marshal Montejan remained Lieutenant-General for the King in Piedmont, having ten or twelve thousand men in garrison in the different cities and castles, who were often fighting among themselves with swords and other weapons, even with arquebuses. And if there were four wounded, I always had three of them; and if there were question of cutting off an arm or a leg, or of trepanning, or of reducing a fracture or a dislocation, I accomplished it all. The Lord Marshal sent me now here now there to dress the soldiers committed to me who were wounded in other cities beside Turin, so that I was always in the country, one way or the other.

M. the Marshal sent to Milan, to a physician of no less reputation than the late M. le Grand for his success in practice, to treat him for an hepatic flux, whereof in the end he died. This physician was some while at Turin to treat him, and was often called to visit the wounded, where always he found me; and I was used to consult with him, and with some other surgeons; and when we had resolved to do any serious work of surgery, it was Ambroise Paré that put his hand thereto, which I would do promptly and skilfully, and with great assurance, insomuch that the physician wondered at me, to be so ready in the operations of surgery, and I so young. One day, discoursing with the Lord Marshal, he said to him:

> Signor, tu hai un Chirurgico giovane di anni, ma egli é vecchio di sapere é di esperientia: Guardalo bene, perche egli ti fara servicio et honore. That is to say, Thou hast a surgeon young in age, but he is old in knowledge and experience: take good care of him, for he will do thee service and honour. But the good man did not know I had lived three years at the Hôtel Dieu in Paris, with the patients there.

In the end, M. the Marshal died of his hepatic flux. He being dead, the King sent M. the Marshal d'Annebaut to be in his place: who did me the honour to ask me to live with him, and he would treat me as well or better than M. the Marshal de Montejan. Which I would not do, for grief at the loss of my master, who loved me dearly; so I returned to Paris.

The Journey to Marolles and Low Brittany. 1543

I WENT to the Camp of Marolles, with the late M. de Rohan, as surgeon of his company; where was the King himself. M. d'Estampes, Governor of Brittany, had told the King how the English had hoist sail to land in Low Brittany; and had prayed him to send, to help him, MM. de Rohan and de Laval, because they were the seigneurs of that country, and by their help the country people would beat back the enemy, and keep them from landing. Having heard this, the King sent these seigneurs to go in haste to the help of their country; and to each was given as much power as to the Governor, so that they were all three the King's Lieutenants. They willingly took this charge upon them, and went off posting with good speed, and took me with them as far as Landreneau. There

we found every one in arms, the tocsin sounding on every side, for a good five or six leagues round the harbours, Brest, Couquet, Crozon, le Fou, Doulac, Laudanec; each well furnished with artillery, as cannons, demi-cannons, culverins, muskets, falcons, arquebuses; in brief, all who came together were well equipped with all sorts and kinds of artillery, and with many soldiers, both Breton and French, to hinder the English from landing as they had resolved at their parting from England.

The enemy's army came right under our cannons: and when we perceived them desiring to land, we saluted them with cannon-shot, and unmasked our forces and our artillery. They fled to sea again. I was right glad to see their ships set sail, which were in good number and good order, and seemed to be a forest moving upon the sea. I saw a thing also whereat I marvelled much, which was, that the balls of the great cannons made long rebounds, and grazed over the water as they do over the earth. Now to make the matter short, our English did us no harm, and returned safe and sound into England. And they leaving us in peace, we stayed in that country in garrison until we were assured that their army was dispersed.

Now our soldiers used often to exercise themselves with running at the ring, or with fencing, so that there was always some one in trouble, and I had always something to employ me. M. d'Estampes, to make pastime and pleasure for the Seigneurs de Rohan and de Laval, and other gentlemen, got a number of village girls to come to the sports, to sing songs in the tongue of Low Brittany: wherein their harmony was like the croaking of frogs when they are in love. Moreover, he made them dance the Brittany *triori,* without moving feet or hips: he made the gentlemen see and hear many good things.

At other times they made the wrestlers of the towns and villages come, where there was a prize for the best: and the sport was not ended but that one or other had a leg or arm broken, or the shoulder or hip dislocated. There was a little man of Low Brittany, of a square body and well set, who long held the credit of the field, and by his skill and strength threw five or six to the ground. There came against him a big man, one Dativo, a pedagogue, who was said to be one of the best wrestlers in all Brittany: he entered into the lists, having thrown off his long jacket, in hose and doublet: when he was near the little man, it looked as though the little man had been tied to his girdle. Nevertheless, when they gripped each other round the neck, they were a long time without doing anything, and we thought they would remain equal in force and skill: but the little man suddenly leaped beneath this big Dativo, and took him on his shoulder, and threw him to earth on his back all spread out like a frog; and all the company laughed at the skill and strength of the little fellow. The great Dativo was furious to have been thus thrown to earth by so small a man: he rose again in a rage, and would have his revenge. They took hold again round the neck, and were again a good while at their hold without falling to the ground: but at last the big man let himself fall upon the little, and in falling put his elbow upon the pit of his stomach, and burst his heart, and killed him stark dead. And knowing he had given him his death's blow, took again his long cassock, and went away with his tail between his legs, and eclipsed himself. Seeing the little man came not again to himself, either for wine, vinegar, or any other thing presented to him, I drew near to him and

felt his pulse, which did not beat at all: then I said he was dead. Then the Bretons, who were assisting at the wrestling, said aloud in their jargon, Andraze meuraquet enes rac un bloa so abeudeux henelep e barz an gouremon enel ma hoa engoustun. That is to say, That is not in the sport. And someone said that this great Dativo was accustomed to do so, and but a year past he had done the same at a wrestling. I must needs open the body to know the cause of this sudden death. I found much blood in the thorax . . . I tried to find some internal opening whence it might have come, which I could not, for all the diligence that I could use . . . The poor little wrestler was buried. I took leave of MM. de Rohan, de Laval, and d'Estampes. M. de Rohan made me a present of fifty double ducats and a horse, M. de Laval gave me a nag for my man, and M. d'Estampes gave me a diamond worth thirty crowns: and I returned to my house in Paris.

The Journey to Perpignan. 1543

SOME while after, M. de Rohan took me with him posting to the camp at Perpignan. While we were there, the enemy sallied out, and surrounded three pieces of our artillery before they were beaten back to the gates of the city. Which was not done without many killed and wounded, among the others M. de Brissac, who was then grand master of the artillery, with an arquebus-shot in the shoulder. When he retired to his tent, all the wounded followed him, hoping to be dressed by the surgeons who were to dress him. Being come to his tent and laid on his bed, the bullet was searched for by three or four of the best surgeons in the army, who could not find it, but said it had entered into his body.

At last he called for me, to see if I could be more skilful than they, because he had known me in Piedmont. Then I made him rise from his bed, and told him to put himself in the same posture that he had when he was wounded, which he did, taking a javelin in his hand just as he had held his pike to fight. I put my hand around the wound, and found the bullet. Having found it, I showed them the place where it was, and it was taken out by M. Nicole Lavernault, surgeon of M. the Dauphin, who was the King's Lieutenant in that army; all the same, the honour of finding it belonged to me.

I saw one very strange thing, which was this: a soldier in my presence gave one of his fellows a blow on the head with a halbard, penetrating to the left ventricle of the brain; yet the man did not fall to the ground. He that struck him said he heard that he had cheated at dice, and he had drawn a large sum of money from him, and was accustomed to cheat. They called me to dress him; which I did, as it were for the last time, knowing that he would die soon. When I had dressed him, he returned all alone to his quarters, which were at the least two hundred paces away. I bade one of his companions send for a priest to dispose the affairs of his soul; he got one for him, who stayed with him to his last breath. The next day, the patient sent for me by his girl, dressed in boy's apparel, to come and dress him; which I would not, fearing he would die under my hands; and to be rid of the matter I told her the dressing must not be removed before the third day. But in truth he was sure to die, though he were never touched again. The third day,

he came staggering to find me in my tent, and the girl with him, and prayed me most affectionately to dress him, and showed me a purse wherein might be an hundred or six score pieces of gold, and said he would give me my heart's desire; nevertheless, for all that, I put off the removal of the dressing, fearing lest he should die then and there. Certain gentlemen desired me to go and dress him; which I did at their request; but in dressing him he died under my hands in a convulsion. The priest stayed with him till death, and seized his purse, for fear another man should take it, saying he would say masses for his poor soul. Also he took his clothes, and everything else.

I have told this case for the wonder of it, that the soldier, having received this great blow, did not fall down, and kept his reason to the end.

Not long afterward, the camp was broken up from diverse causes: one, because we were told that four companies of Spaniards were entered into Perpignan: the other, that the plague was spreading through the camp. Moreover, the country folk warned us there would soon be a great overflowing of the sea, which might drown us all. And the presage which they had, was a very great wind from sea, which rose so high that there remained not a single tent but was broken and thrown down, for all the care and diligence we could give; and the kitchens being all uncovered, the wind raised the dust and sand, which salted and powdered our meats in such fashion that we could not eat them; and we had to cook them in pots and other covered vessels. Nor was the camp so quickly moved but that many carts and carters, mules and mule drivers, were drowned in the sea, with great loss of baggage.

When the camp was moved I returned to Paris.

The Journey to Landresy. 1544

THE KING raised a great army to victual Landresy. Against him the Emperor had no fewer men, but many more, to wit, eighteen thousand Germans, ten thousand Spaniards, six thousand Walloons, ten thousand English, and from thirteen to fourteen thousand horse. I saw the two armies near each other, within cannon-shot; and we thought they could not withdraw without giving battle. There were some foolish gentlemen who must needs approach the enemy's camp; the enemy fired on them with light field pieces; some died then and there, others had their arms or legs carried away. The King having done what he wished, which was to victual Landresy, withdrew his army to Guise, which was the day after All Saints, 1544; and from there I returned to Paris.

The Journey to Boulogne. 1545

A LITTLE while after, we went to Boulogne; where the English, seeing our army, left the forts which they were holding, Moulambert, le petit Paradis, Monplaisir, the fort of Chastillon, le Portet, the fort of Dardelot. One day, as I was going through the camp to dress my wounded men, the enemy who were in the Tour d'Ordre fired a cannon against us, thinking to kill two men-at-arms who had stopped to talk together. It happened that

the ball passed quite close to one of them, which threw him to the ground, and it was thought the ball had touched him, which it did not; but only the wind of the ball full against his corselet, with such force that all the outer part of his thigh became livid and black, and he could hardly stand. I dressed him, and made diverse scarifications to let out the bruised blood made by the wind of the ball; and by the rebounds that it made on the ground it killed four soldiers, who remained dead where they fell.

Monseigneur the Duc de Guise, François de Lorraine, was wounded before Boulogne with a thrust of a lance, which entered above the right eye, toward the nose, and passed out on the other side between the ear and the back of the neck, with so great violence that the head of the lance, with a piece of the wood, was broken and remained fast; so that it could not be drawn out save with extreme force, with smith's pincers. Yet notwithstanding the great violence of the blow, which was not without fracture of bones, nerves, veins, and arteries, and other parts torn and broken, my lord, by the grace of God, was healed. He was used to go into battle always with his vizard raised: that is why the lance passed right out on the other side.

The Journey to Germany. 1552

I WENT to Germany, in the year 1552, with M. de Rohan, captain of fifty men-at-arms, where I was surgeon of his company, as I have said before. On this expedition, M. the Constable was general of the army; M. de Chastillon, afterward the Admiral, was chief colonel of the infantry, with four regiments of lansquenets under Captains Recrod and Ringrave, two under each; and every regiment was of ten ensigns, and every ensign of five hundred men. And beside these were Captain Chartel, who led the troops that the Protestant princes had sent to the King (this infantry was very fine, and was accompanied by fifteen hundred men-at-arms, with a following of two archers apiece, which would make four thousand five hundred horse); and two thousand light horse, and as many mounted arquebusiers, of whom M. d'Aumalle was general; and a great number of the nobility, who were come there for their pleasure. Moreover, the King was accompanied by two hundred gentlemen of his household, under the command of the Seigneurs de Boisy and de Canappe, and by many other princes. For his following, to escort him, there were the French and Scotch and Swiss guards, amounting to six hundred foot soldiers; and the companies of MM. the Dauphin, de Guise, d'Aumalle, and Marshal Saint André, amounting to four hundred lances; which was a marvellous thing, to see such a multitude; and with this equipage the King entered into Toul and Metz.

I must not omit to say that the companies of MM. de Rohan, the Comte de Sancerre, and de Jarnac, which were each of them of fifty horse, went upon the wings of the camp. And God knows how scarce we were of victuals, and I protest before Him that at three diverse times I thought to die of hunger; and it was not for want of money, for I had enough of it; but we could not get victuals save by force, because the country people collected them all into the towns and castles.

One of the servants of the captain-ensign of the company of M. de Rohan went with others to enter a church where the peasants were retreated, thinking to get victuals by love or by force; but he got the worst of it, as they all did, and came back with seven sword-wounds on the head, the least of which penetrated to the inner table of the skull; and he had four other wounds upon the arms, and one on the right shoulder, which cut more than half of the blade-bone. He was brought back to his master's lodging, who seeing him so mutilated, and not hoping he could be cured, made him a grave, and would have cast him therein, saying that else the peasants would massacre and kill him. I in pity told him the man might still be cured if he were well dressed. Diverse gentlemen of the company prayed he would take him along with the baggage, since I was willing to dress him; to which he agreed, and after I had got the man ready, he was put in a cart, on a bed well covered and well arranged, drawn by a horse. I did him the office of physician, apothecary, surgeon, and cook. I dressed him to the end of his case, and God healed him; insomuch that all the three companies marvelled at this cure. The men-at-arms of the company of M. de Rohan, the first muster that was made, gave me each a crown, and the archers half a crown.

The Journey to Danvilliers. 1552

ON HIS return from the expedition against the German camp, King Henry besieged Danvilliers, and those within would not surrender. They got the worst of it, but our powder failed us; so they had a good shot at our men. There was a culverin-shot passed through the tent of M. de Rohan, which hit a gentleman's leg who was of his household. I had to finish the cutting off of it, which I did without applying the hot irons.

The King sent for powder to Sedan, and when it came we began the attack more vigorously than before, so that a breach was made. MM. de Guise and the Constable, being in the King's chamber, told him, and they agreed that next day they would assault the town, and were confident they would enter into it; and it must be kept secret, for fear the enemy should come to hear of it; and each promised not to speak of it to any man. Now there was a groom of the King's chamber, who being laid under the King's camp-bed to sleep, heard they were resolved to attack the town next day. So he told the secret to a certain captain, saying that they would make the attack next day for certain, and he had heard it from the King, and prayed the said captain to speak of it to no man, which he promised; but his promise did not hold, and forthwith he disclosed it to a captain, and this captain to a captain, and the captains to some of the soldiers, saying always, Say nothing. And it was just so much hid, that next day early in the morning there was seen the greater part of the soldiers with their boots and breeches cut loose at the knee for the better mounting of the breach. The King was told of this rumour that ran through the camp, that the attack was to be made; whereat he was astonished, seeing there were but three in that advice, who had promised each other to tell it to no man. The King sent for M. de Guise, to know if he had spoken of this attack; he swore and affirmed to him he had not told it to anybody; and M. the Constable said the same,

and told the King they must know for certain who had declared this secret counsel, seeing they were but three. Inquiry was made from captain to captain. In the end they found the truth; for one said, It was such an one told me, and another said the same, till it came to the first of all, who declared he had heard it from the groom of the King's chamber, called Guyard, a native of Blois, son of a barber of the late King Francis. The King sent for him into his tent, in the presence of MM. de Guise and the Constable, to hear from him whence he had his knowledge, and who had told him the attack was to be made; and said if he did not speak the truth he would have him hanged. Then he declared he lay down under the King's bed thinking to sleep, and so having heard the plan he revealed it to a captain who was a friend of his, to the end he might prepare himself with his soldiers to be the first at the attack. Then the King knew the truth, and told him he should never serve him again, and that he deserved to be hanged, and forbade him ever to come again to the Court.

The groom of the chamber went away with this to swallow, and slept that night with a surgeon-in-ordinary of the King, Master Louis of Saint André; and in the night he gave himself six stabs with a knife, and cut his throat. Nor did the surgeon perceive it till the morning, when he found his bed all bloody, and the dead body by him. He marvelled at this sight on his awaking, and feared they would say he was the cause of the murder; but he was soon relieved, seeing the reason, which was despair at the loss of the good friendship of the King.

So Guyard was buried. And those of Danvilliers, when they saw the breach large enough for us to enter, and our soldiers ready to assault them, surrendered themselves to the mercy of the King. Their leaders were taken prisoners, and their soldiers were sent away without arms.

The camp being dispersed, I returned to Paris with my gentleman whose leg I had cut off; I dressed him, and God healed him. I sent him to his house merry with a wooden leg; and he was content, saying he had got off cheap, not to have been miserably burned to stop the blood, as you write in your book, *mon petit maistre.*

The Journey to Château Le Comte. 1552

SOME time after, King Henry raised an army of thirty thousand men, to go and lay waste the country about Hesdin. The King of Navarre, who was then called M. de Vendosme, was chief of the army, and the King's Lieutenant. Being at St. Denis, in France, waiting while the companies passed by, he sent to Paris for me to speak with him. When I came he begged me (and his request was a command) to follow him on this journey; and I, wishing to make my excuses, saying my wife was sick in bed, he made answer there were physicians in Paris to cure her, and he, too, had left his wife, who was of as good a house as mine, and he said he would use me well, and forthwith ordered I should be attached to his household. Seeing this great desire he had to take me with him, I dared not refuse him.

I went after him to Château le Comte, within three or four leagues of Hesdin. The Emperor's soldiers were in garrison there, with a number of peasants from the country

road. M. de Vendosme called on them to surrender; they made answer that he should never take them, unless it were piecemeal; let him do his worst, and they would do their best to defend themselves. They trusted in their moats, which were full of water; but in two hours, with plenty of faggots and casks, we made a way for our infantry to pass over, when they had to advance to the assault; and the place was attacked with five cannons, and a breach was made large enough for our men to enter; where those within received the attack very valiantly, and killed and wounded a great number of our men with arquebuses, pikes, and stones. In the end, when they saw themselves overpowered, they set fire to their powder and ammunition, whereby many of our men were burned, and some of their own. And they were almost all put to the sword; but some of our soldiers had taken twenty or thirty, hoping to have ransom for them: and so soon as this was known, orders were given to proclaim by trumpet through the camp, that all soldiers who had Spaniards for prisoners must kill them, on pain of being themselves hanged and strangled: which was done in cold blood.

Thence we went and burned several villages; and the barns were all full of grain, to my very great regret. We came as far as Tournahan, where there was a large tower, whither the enemy withdrew, but we found the place empty: our men sacked it, and blew up the tower with a mine of gunpowder, which turned it upside down. After that, the camp was dispersed, and I returned to Paris. And the day after Château le Comte was taken, M. de Vendosme sent a gentleman under orders to the King, to report to him all that had happened, and among other things he told the King I had done very good work dressing the wounded, and had showed him eighteen bullets that I had taken out of their bodies, and there were many more that I had not been able to find or take out; and he spoke more good of me than there was by half. Then the King said he would take me into his service, and commanded M. de Goguier, his first physician, to write me down in the King's service as one of his surgeons-in-ordinary, and I was to meet him at Rheims within ten or twelve days: which I did. And the King did me the honour to command me to live near him, and he would be a good friend to me. Then I thanked him most humbly for the honour he was pleased to do me in appointing me to serve him.

The Journey to Metz. 1552

THE EMPEROR having besieged Metz with more than an hundred and twenty thousand men, and in the hardest time of winter, it is still fresh in the minds of all and there were five or six thousand men in the town, and among them seven princes; MM. le Duc de Guise, the King's Lieutenant, d'Enghien, de Condé, de la Montpensier, de la Roche-sur-Yon, de Nemours, and many other gentlemen, with a number of veteran captains and officers; who often sallied out against the enemy (as I shall tell hereafter), not without heavy loss on both sides. Our wounded died almost all, and it was thought the drugs wherewith they were dressed had been poisoned. Wherefore M. de Guise, and MM. the princes, went so far as to beg the King that if it were possible I should be sent to them with a supply of drugs, and they believed their drugs were poisoned, seeing

that few of their wounded escaped. My belief is that there was no poison; but the severe cutlass and arquebus wounds, and the extreme cold, were the cause why so many died. The King wrote to M. the Marshal de Saint André, who was his Lieutenant at Verdun, to find means to get me into Metz, whatever way was possible. MM. the Marshal de Saint André, and the Marshal de Vielleville, won over an Italian captain, who promised to get me into the place, which he did (and for this he had fifteen hundred crowns). The King having heard the promise that the Italian captain had made, sent for me, and commanded me to take of his apothecary, named Daigne, so many and such drugs as I should think necessary for the wounded within the town; which I did, as much as a post-horse could carry. The King gave me messages to M. de Guise, and to the princes and the captains that were in Metz.

When I came to Verdun, some days after, M. the Marshal de Saint André got horses for me and for my man, and for the Italian captain, who spoke excellent German, Spanish, and Walloon, beside his own mother-tongue. When we were within eight or ten leagues of Metz, we began to go by night only; and when we came near the enemy's camp I saw, more than a league and a half off, fires lighted all round the town, as if the whole earth were burning; and I believed we could never pass through these fires without being discovered, and therefore hanged and strangled, or cut in pieces, or made to pay a great ransom. To speak truth, I could well and gladly have wished myself back in Paris, for the great danger that I foresaw. God guided our business so well, that we entered into the town at midnight, thanks to a signal the captain had with another captain of the company of M. de Guise; to whom I went, and found him in bed, and he received me with high favour, being right glad at my coming.

I gave him my message as the King had commanded me, and told him I had a little letter for him, and the next day I would not fail to deliver it. Then he ordered me a good lodging, and that I should be well treated, and said I must not fail next morning to be upon the breach, where I should find all the princes and seigneurs, and many captains. Which I did, and they received me with great joy, and did me the honour to embrace me, and tell me I was welcome; adding they would no more be afraid of dying, if they should happen to be wounded.

M. le Prince de la Roche-sur-Yon was the first who entertained me, and inquired what they were saying at the Court concerning the town of Metz. I told him all that I chose to tell. Forthwith he begged me to go and see one of his gentlemen named M. de Magnane, now Chevalier of the Order of the King, and Lieutenant of His Majesty's Guards, who had his leg broken by a cannon-shot. I found him in bed, his leg bent and crooked, without any dressing on it, because a gentleman promised to cure him, having his name and his girdle, with certain words (and the poor patient was weeping and crying out with pain, not sleeping day or night for four days past). Then I laughed at such cheating and false promises; and I reduced and dressed his leg so skilfully that he was without pain, and slept all the night, and afterward, thanks be to God, he was healed, and is still living now, in the King's service. The Prince de la Roche-sur-Yon sent me a cask of wine, bigger than a pipe of Anjou, to my lodging,

and told me when it was drunk, he would send me another; that was how he treated me, most generously.

After this, M. de Guise gave me a list of certain captains and seigneurs, and bade me tell them what the King had charged me to say; which I did, and this was to commend him to them, and give them his thanks for the duty they had done and were doing in holding his town of Metz, and that he would remember it. I was more than eight days acquitting myself of this charge, because they were many. First, to all the princes; then to others, as the Duke Horace, the Count de Martigues, and his brother M. de Baugé, the Seigneurs de Montmorency and d'Anville, now Marshal of France, M. de la Chapelle aux Ursins, Bonnivet, Carouge, now Governor of Rouen, the Vidame de Chartres, the Count de Lude, M. de Biron, now Marshal of France, M. de Randan, la Rochefoucault, Bordaille, d'Estres the younger, M. de Saint Jean en Dauphiné, and many others whom it would take too long to name; and also to many captains, who had all done their duty well for the defence of their lives and of the town. Afterward I asked M. de Guise what it pleased him I should do with the drugs I had brought with me; he bade me distribute them to the surgeons and apothecaries, and principally to the poor wounded soldiers, who were in great numbers in the Hospital. Which I did, and can truly say I could not so much as go and see all the wounded, who kept sending for me to visit and dress them.

All the seigneurs within the town asked me to give special care, above all the rest, to M. de Pienne, who had been wounded, while on the breach, by a stone shot from a cannon, on the temple, with fracture and depression of the bone. They told me that so soon as he received the blow, he fell to the ground as dead, and cast forth blood by the mouth, nose, and ears, with great vomiting, and was fourteen days without being able to speak or reason; also he had tremors of a spasmodic nature, and all his face was swelled and livid. He was trepanned at the side of the temporal muscle, over the frontal bone. I dressed him, with other surgeons, and God healed him; and to-day he is still living, thank God.

The Emperor attacked the town with forty double cannons, and the powder was not spared day or night. So soon as M. de Guise saw the artillery set and pointed to make a breach, he had the nearest houses pulled down and made into ramparts, and the beams and joists were put end to end, and between them faggots, earth, beds, and wool-packs; then they put above them other beams and joists as before. And there was plenty of wood from the houses in the suburbs; which had been razed to the ground, for fear the enemy should get under cover of them, and make use of the wood; it did very well for repairing the breach. Everybody was hard at work carrying earth to repair it, day and night; MM. the princes, the seigneurs, and captains, lieutenants, ensigns, were all carrying the basket, to set an example to the soldiers and citizens to do the like, which they did; even the ladies and girls, and those who had not baskets, made use of cauldrons, panniers, sacks, sheets, and all such things to carry the earth; so that the enemy had no sooner broken down the wall than they found behind it a yet stronger rampart. The wall having fallen, our men cried out at those outside, Fox, fox, fox, and they vented a

thousand insults against one another. M. de Guise forbade any man on pain of death to speak with those outside, for fear there should be some traitor who would betray what was being done within the town. After this order, our men tied live cats to the ends of their pikes, and put them over the wall and cried with the cats, Miaut, Miaut.

Truly the Imperials were much enraged, having been so long making a breach, at great loss, which was eighty paces wide, that fifty men of their front rank should enter in, only to find a rampart stronger than the wall. They threw themselves upon the poor cats, and shot them with arquebuses as men shoot at the popinjay.

Our men often ran out upon them, by order of M. de Guise; a few days ago, our men had all made haste to enroll themselves in sallying-parties, chiefly the young nobility, led by experienced captains; and indeed it was doing them a great favour to let them issue from the town and run upon the enemy. They went forth always an hundred or six score men, well armed with cutlasses, arquebuses, pistols, pikes, partisans, and halbards; and advanced as far as the trenches, to take the enemy unawares. Then an alarum would be sounded all through the enemy's camp, and their drums would beat plan, plan, ta ti ta, ta ta ti ta, tou touf touf. Likewise their trumpets and clarions rang and sounded, To saddle, to saddle, to saddle, to horse, to horse, to horse, to saddle, to horse, to horse. And all their soldiers cried, Arm, arm, arm! to arms, to arms, to arms! arm, to arms, arm, to arms, arm: like the hue-and-cry after wolves; and all diverse tongues, according to their nations; and you saw them come out of their tents and little lodgings, as thick as little ants when you uncover the ant-hills, to bring help to their comrades, who were having their throats cut like sheep. Their cavalry also came from all sides at full gallop, patati, patata, patati, patata, pa, ta, ta, patata, pata, ta, eager to be in the thick of the fighting, to give and take their share of the blows. And when our men saw themselves hard pressed, they would turn back into the town, fighting all the way; and those pursuing them were driven back with cannon-shots, and the cannons were loaded with flint-stones and with big pieces of iron, square or three-sided. And our men on the wall fired a volley, and rained bullets on them as thick as hail, to send them back to their beds; whereas many remained dead on the field: and our men also did not all come back with whole skins, and there were always some left behind (as it were a tax levied on us) who were joyful to die on the bed of honour. And if there was a horse wounded, it was skinned and eaten by the soldiers, instead of beef and bacon; and if a man was wounded, I must run and dress him. Some days afterward there were other sallies, which infuriated the enemy, that we would not let him sleep a little in safety.

M. de Guise played a trick upon them: he sent a peasant, who was none of the wisest, with two letters to the King, and gave him ten crowns, and promised the King would give him an hundred if he got the letters to him. In the one letter M. de Guise told the King that the enemy shewed no signs of retreating, and had put forth all their strength and made a great breach, which he hoped to defend, even at the cost of his own life and of all who were in the town; and that the enemy had planted their artillery so well in a certain place (which he named) that it was with great difficulty he could keep them from entering the town, seeing it was the weakest place in the town; but soon he

hoped to rebuild it well, so that they should not be able to enter. This letter was sewed in the lining of the man's doublet, and he was told to be very careful not to speak of it to any person. And the other letter was given to him, wherein M. de Guise told the King that he and all those besieged with him hoped to guard the town well; and other matters which I leave untold here. He sent out the man at night, and he was taken by the enemy's guard and brought to the Duke of Alva, that the Duke might hear what was doing in the town; and the peasant was asked if he had any letters. He said Yes, and gave them the one; and they having seen it asked him if he had not another. He said No. Then he was searched, and they found on him that which was sewed in his doublet; and the poor messenger was hanged and strangled.

The letters were taken to the Emperor, who called his council, where it was resolved, since they had been unable to do anything at the first breach, the artillery should forthwith be set against the place which they thought weakest, where they put forth all their strength to make a fresh breach; and they sapped and mined the wall, and tried hard to make a way into the Hell Tower, but dared not assault it openly.

The Duke of Alva represented to the Emperor that every day their soldiers were dying, to the number of more than two hundred, and there was so little hope of entering the town, seeing the time of year and the great number of our soldiers who were in it. The Emperor asked what men they were who were dying, and whether they were gentlemen and men of mark; answer was made to him. They were all poor soldiers. Then said he, It was no great loss if they died, comparing them to caterpillars, grasshoppers, and cockchafers, which eat up the buds and other good things of the earth; and if they were men of any worth they would not be in his camp at six livres the month, and therefore it was no great harm if they died. Moreover, he said he would never depart from the town till he had taken it by force or by famine, though he should lose all his army; because of the great number of princes who were shut up in it, with the greater part of the nobility of France, who he hoped would pay his expenses four times over; and he would go yet again to Paris, to see the Parisians, and to make himself King of all the kingdom of France.

M. de Guise, with the princes, captains, and soldiers, and in general all the citizens of the town, having heard the Emperor's resolve to exterminate us all, forbade the soldiers and citizens, and even the princes and seigneurs, to eat fresh fish or venison, or partridges, woodcocks, larks, francolines, plovers, or other game, for fear these had acquired any pestilential air which could bring infection among us. So they had to content themselves with the fare of the army; biscuit, beef, salt cow-beef, bacon, cervelas, and Mayence hams; also fish, as haddock, salmon, shad, tunny, whale, anchovy, sardines, herrings; also peas, beans, rice, garlic, onions, prunes, cheeses, butter, oil, and salt; pepper, ginger, nutmegs and other spices to put in our pies, mostly of horses, which without the spice had a very bad taste. Many citizens, having gardens in the town, had planted them with fine radishes, turnips, carrots, and leeks, which they kept flourishing and very dear, for the extreme necessity of the famine. Now all these stores were distributed by weight, measure, and justice, according to the quality of the persons, because we knew not how

long the siege would last. For after we heard the Emperor's words, how he would not depart from before Metz, till he had taken it by force or by famine, the victuals were cut down; and what they used to distribute to three soldiers was given to four; and it was forbidden to them to sell the remains which might be left after their meals; but they might give them to the rabble. And they always rose from table with an appetite, for fear they should be subject to take physick.

And before we surrendered to the mercy of the enemy, we had determined to eat the asses, mules, and horses, dogs, cats, and rats, even our boots and collars, and other skins that we could have softened and stewed. And, in a word, all the besieged were resolved to defend themselves valiantly with all instruments of war; to set the artillery at the entry of the breach, and load with balls, stones, cart-nails, bars and chains of iron; also all sorts and kinds of artificial fires, as barricadoes, grenades, stink-pots, torches, squibs, fire-traps, burning faggots; with boiling water, melted lead, and lime, to put out the enemy's eyes. Also, they were to make holes right through their houses, and put arquebusiers in them, to take the enemy in flank and hasten his going, or else give him stop then and there. Also they were to order the women to pull up the streets, and throw from their windows billets, tables, trestles, benches, and stools, to dash out the enemy's brains. Moreover, a little within the breach, there was a great stronghold full of carts and palisades, tuns and casks; and barricades of earth to serve as gabions, interlaid with falconets, falcons, field-pieces, crooked arquebuses, pistols, arquebuses, and wild-fires, to break their legs and thighs, so that they would be taken from above and on the flank and from behind; and if they had carried this stronghold, there were others where the streets crossed, every hundred paces, which would have been as bad friends to them as the first, or worse, and would have made many widows and orphans. And if fortune had been so hard on us that they had stormed and broken up our strongholds, there would yet have been seven great companies, drawn up in square and in triangle, to fight them all at once, each led by one of the princes, for the better encouragement of our men to fight and die all together, even to the last breath of their souls. And all were resolved to bring their treasures, rings, and jewels, and their best and richest and most beautiful household stuffs, and burn them to ashes in the great square, lest the enemy should take them and make trophies of them. Also there were men charged to set fire to all the stores and burn them, and to stave in all the wine-casks; others to set fire to every single house, to burn the enemy and us together. The citizens thus were all of one mind, rather than see the bloody knife at their throats, and their wives and daughters ravished and taken by the cruel savage Spaniards.

Now we had certain prisoners, who had been made secretly to understand our last determination and desperation; these prisoners M. de Guise sent away on parole, who being come to their camp, lost no time in saying what we had told them; which restrained the great and vehement desire of the enemy, so that they were no longer eager to enter the town to cut our throats and enrich themselves with the spoils. The Emperor, having heard the decision of this great warrior, M. de Guise, put water in his wine, and restrained his fury; saying that he could not enter the town save with vast butchery and carnage, and shedding of much blood, both of those defending and of those attacking,

and they would be all dead together, and in the end he would get nothing but ashes; and afterward men might say it was a like destruction to that of the town of Jerusalem, made of old time by Titus and Vespasian.

The Emperor thus having heard our last resolve, and seeing how little he had gained by his attack, sappings, and mines, and the great plague that was through all his camp, and the adverse time of the year, and the want of victuals and of money, and how his soldiers were disbanding themselves and going off in great companies, decided at last to raise the siege and go away, with the cavalry of his vanguard, and the greater part of the artillery and engines of war. The Marquis of Brandebourg was the last to budge from his place; he had with him some troops of Spaniards and Bohemians, and his German regiments, and there he stopped for a day and a half, to the great regret of M. de Guise, who brought four pieces of artillery out of the town, which he fired on him this side and that, to hurry him off: and off he went, sure enough, and all his men with him.

When he was a quarter of a league from Metz, he was seized with a panic lest our cavalry should fall upon his tail; so he set fire to his store of powder, and left behind him some pieces of artillery, and a quantity of baggage, which he could not take along with him, because their vanguard and their great cannons had broken and torn up the roads. Our cavalry were longing with all their hearts to issue from the town and attack him behind; but M. de Guise would never let them, saying on the contrary we had better make their way smooth for them, and build them gold and silver bridges to let them go; like the good pastor and shepherd, who will not lose one of his sheep.

That is how our dear and well-beloved Imperials went away from Metz, which was the day after Christmas Day, to the great content of those within the walls, and the praise of the princes, seigneurs, captains, and soldiers, who had endured the travail of this siege for more than two months. Nevertheless, they did not all go: there wanted more than twenty thousand of them, who were dead, from our artillery and the fighting, or from plague, cold, and starvation (and from spite and rage that they could not get into the town to cut our throats and plunder us): and many of their horses also died, the greater part whereof they had eaten instead of beef and bacon. We went where their camp had been, where we found many dead bodies not yet buried, and the earth all worked up, as one sees in the Cemetery of the Holy Innocents during some time of many deaths. In their tents, pavilions, and lodgings were many sick people. Also cannon-shot, weapons, carts, waggons, and other baggage, with a great quantity of soldier's bread, spoiled and rotted by the snows and rains (yet the soldiers had it but by weight and measure). Also they left a good store of wood, all that remained of the houses they had demolished and broken down in the villages for two or three leagues around; also many other pleasure-houses, that had belonged to our citizens, with gardens and fine orchards full of diverse fruittrees. And without all this, they would have been benumbed and dead of the cold, and forced to raise the siege sooner than they did.

M. de Guise had their dead buried, and their sick people treated. Also the enemy left behind them in the Abbey of Saint Arnoul many of their wounded soldiers, whom they could not possibly take with them. M. de Guise sent them all victuals enough, and

ordered me and the other surgeons to go dress and physick them, which we did with good will; and I think they would not have done the like for our men. For the Spaniard is very cruel, treacherous, and inhuman, and so far enemy of all nations: which is proved by Lopez the Spaniard, and Benzo of Milan, and others who have written the history of America and the West Indies: who have had to confess that the cruelty, avarice, blasphemies, and wickedness of the Spaniards have utterly estranged the poor Indians from the religion that these Spaniards professed. And all write that they are of less worth than the idolatrous Indians, for their cruel treatment of these Indians.

And some days later M. de Guise sent a trumpet to Thionville to the enemy, that they could send for their wounded in safety: which they did with carts and waggons, but not enough. M. de Guise gave them carts and carters, to help to take them to Thionville. Our carters, when they returned, told us the roads were all paved with dead bodies, and they never got half the men there, for they died in their carts: and the Spaniards seeing them at the point of death, before they had breathed their last, threw them out of the carts and buried them in the mud and mire, saying they had no orders to bring back dead men. Moreover, our carters said they had found on the roads many carts stuck in the mud, full of baggage, for which the enemy dared not send back, lest we who were within Metz should run out upon them.

I would return to the reason why so many of them died; which was mostly starvation, the plague, and cold. For the snow was more than two feet deep upon the ground, and they were lodged in pits below the ground, covered only with a little thatch. Nevertheless, each soldier had his camp-bed, and a coverlet all strewed with stars, glittering and shining brighter than fine gold, and every day they had white sheets, and lodged at the sign of the Moon, and enjoyed themselves if only they had been able, and paid their host so well over night that in the morning they went off quits, shaking their ears: and they had no need of a comb to get the down and feathers out of their beards and hair, and they always found a white tablecloth, and would have enjoyed good meals but for want of food. Also the greater part of them had neither boots, half-boots, slippers, hose, nor shoes: and most of them would rather have none than any, because they were always in the mire up to mid-leg. And because they went bare-foot, we called them the Emperor's Apostles.

After the camp was wholly dispersed, I distributed my patients into the hands of the surgeons of the town, to finish dressing them: then I took leave of M. de Guise, and returned to the King, who received me with great favour, and asked me how I had been able to make my way into Metz. I told him fully all that I had done. He gave me two hundred crowns, and an hundred which I had when I set out: and said he would never leave me poor. Then I thanked him very humbly for the good and the honour he was pleased to do me.

The Journey to Hesdin. 1553

THE EMPEROR Charles laid siege to the town of Theroüenne; and M. le Duc de Savoie was General of his whole army. It was taken by assault: and there was a great number of our men killed and taken prisoners.

The King, wishing to prevent the enemy from besieging the town and castle of Hesdin also, sent thither MM. le Duc de Bouillon, le Duc Horace, le Marquis de Villars, and a number of captains, and about eighteen hundred soldiers: and during the siege of Theroüenne, these Seigneurs fortified the castle of Hesdin, so that it seemed to be impregnable. The King sent me to the Seigneurs, to help them with my art, if they should come to have need of it.

Soon after the capture of Theroüenne, we were besieged in Hesdin. There was a clear stream of running water within shot of our cannon, and about it were fourscore or an hundred of the enemy's rabble, drawing water. I was on a rampart watching the enemy pitch their camp; and, seeing the crowd of idlers round the stream, I asked M. du Pont, commissary of the artillery, to send one cannon-shot among this *canaille:* he gave me a flat refusal, saying that all this sort of people was not worth the powder would be wasted on them. Again I begged him to level the cannon, telling him, The more dead, the fewer enemies; which he did for my sake: and the shot killed fifteen or sixteen, and wounded many. Our men made sorties against the enemy, wherein many were killed and wounded on both sides, with gunshot or with fighting hand to hand; and our men often sallied out before their trenches were made; so that I had my work cut out for me, and had no rest either day or night for dressing the wounded.

And here I would note that we had put many of them in a great tower, laying them on a little straw: and their pillows were stones, their coverlets were cloaks, those who had any. When the attack was made, so often as the enemy's cannons were fired, our wounded said they felt pain in their wounds, as if you had struck them with a stick: one was crying out on his head, the other on his arm, and so with the other parts of the body: and many had their wounds bleed again, even more profusely than at the time they were wounded, and then I had to run to staunch them. *Mon petit maistre,* if you had been there, you would have been much hindered with your hot irons; you would have wanted a lot of charcoal to heat them red, and sure you would have been killed like a calf for your cruelty. Many died of the diabolical storm of the echo of these engines of artillery, and the vehement agitation and severe shock of the air acting on their wounds; others because they got no rest for the shouting and crying that were made day and night, and for want of good food, and other things needful for their treatment. *Mon petit maistre,* if you had been there, no doubt you could have given them jelly, restoratives, gravies, pressed meats, broth, barley-water, almond-milk, blanc-mange, prunes, plums, and other food proper for the sick; but your diet would have been only on paper, and in fact they had nothing but beef of old shrunk cows, seized round Hesdin for our provision, salted and half-cooked, so that he who would eat it must drag at it with his teeth, as birds of prey tear their food. Nor must I forget the linen for dressing their wounds, which was only washed daily and dried at the fire, till it was as hard as parchment: I leave you to think how their wounds could do well. There were four big fat rascally women who had charge to whiten the linen, and were kept at it with the stick; and yet they had not water enough to do it, much less soap. That is how the poor patients died, for want of food and other necessary things.

One day the enemy feigned a general attack, to draw our soldiers into the breach, that they might see what we were like: every man ran thither. We had made a great store of artificial fires to defend the breach; a priest of M. le Duc de Bouillon took a grenade, thinking to throw it at the enemy, and lighted it before he ought: it burst, and set fire to all our store, which was in a house near the breach. This was a terrible disaster for us, because it burned many poor soldiers; it even caught the house, and we had all been burned, but for help given to put it out; there was only one well in the castle with any water in it, and this was almost dry, and we took beer to put it out instead of water; afterward we were in great want of water, and to drink what was left we must strain it through napkins.

The enemy, seeing the explosion and violence of the fires, which made a wonderful flame and thundering, thought we had lit them on purpose to defend the breach, and that we had many more of them. This made them change their minds, to have us some other way than by attack: they dug mines, and sapped the greater part of our walls, till they came near turning our castle altogether upside down; and when the sappers had finished their work, and their artillery was fired, all the castle shook under our feet like an earthquake, to our great astonishment. Moreover, they had levelled five pieces of artillery, which they had placed on a little hillock, so as to have us from behind when we were gone to defend the breach. M. le Duc Horace had a cannon-shot on the elbow, which carried off his arm one way and his body the other, before he could say a single word; his death was a great disaster to us, for the high rank that he held in the town. Also M. de Martigues had a gun-shot wound which pierced his lungs: I dressed him, as I shall tell hereafter.

Then we asked leave to speak with the enemy; and a trumpet was sent to the Prince of Piedmont to know what terms he would give us. He answered that all the leaders, such as gentlemen, captains, lieutenants, and ensigns, would be taken prisoners for ransom, and the soldiers would leave the town without their arms; and if we refused this fair and honest offer, we might rest assured they would take us next day, by attack or otherwise.

A council was held, to which I was called, to know if I would sign the surrender of the town; with many captains, gentlemen, and others. I answered it was not possible to hold the town, and I would sign the surrender with my own blood, for the little hope I had we could resist the enemy's forces, and for the great longing I had to be out of this hell and utter torture; for I slept neither night nor day for the great number of the wounded, who were about two hundred. The dead were advanced in putrefaction, piled one upon the other like faggots, and not covered with earth, because we had none. And if I went into a soldier's lodging, there were soldiers waiting for me at the door when I came out, for me to dress others; it was who should have me, and they carried me like the body of a saint, with my feet off the ground, fighting for me. I could not satisfy this great number of wounded: nor had I got what I wanted for their treatment. For it is not enough that the surgeon do his duty toward his patients, but the patient also must do his; and the assistants, and external things, must work together for him: *see Hippocrates, Aphorism the First.*

Having heard that we were to surrender the place, I knew our business was not prospering; and for fear of being known, I gave a velvet coat, a satin doublet, and a cloak of fine cloth trimmed with velvet, to a soldier; who gave me a bad doublet all torn and ragged with wear, and a frayed leather collar, and a bad hat, and a short cloak; I dirtied the neck of my shirt with water mixed with a little soot, I rubbed my hose with a stone at the knees and over the heels, as though they had been long worn. I did the same to my shoes, till one would have taken me for a chimney-sweep rather than a King's surgeon. I went in this gear to M. de Martigues, and prayed him to arrange I should stop with him to dress him; which he granted very willingly, and was as glad I should be near him as I was myself.

Soon afterward, the commissioners who were to select the prisoners entered the castle, the seventeenth day of July, 1553. They took prisoners MM. le Duc de Bouillon, le Marquis de Villars, de Roze, le Baron de Culan, M. du Pont, commissary of the artillery, and M. de Martigues; and me with him, because he asked them; and all the gentlemen who they knew could pay ransom, and most of the soldiers and the leaders of companies; so many and such prisoners as they wished. And then the Spanish soldiers entered by the breach, unresisted; our men thought they would keep their faith and agreement that all lives should be spared. They entered the town in a fury to kill, plunder, and ravage everything: they took a few men, hoping to have ransom for them. If they saw they could not get it, they cruelly put them to death in cold blood. And they killed them all with daggers, and cut their throats. Such was their great cruelty and treachery; let him trust them who will.

To return to my story: when I was taken from the castle into the town, with M. de Martigues, there was one of M. de Savoie's gentlemen, who asked me if M. de Martigues's wound could be cured. I told him no, that it was incurable: and off he went to tell M. le Duc de Savoie. I bethought myself they would send physicians and surgeons to dress M. de Martigues; and I argued within myself if I ought to play the simpleton, and not let myself be known for a surgeon, lest they should keep me to dress their wounded, and in the end I should be found to be the King's surgeon, and they would make me pay a big ransom. On the other hand, I feared, if I did not show I was a surgeon and had dressed M. de Martigues skilfully, they would cut my throat. Forthwith I made up my mind to show them he would not die for want of having been well dressed and nursed.

Soon after, sure enough, there came many gentlemen, with the Emperor's physician, and his surgeon, and those belonging to M. de Savoie, and six other surgeons of his army, to see M. de Martigues's wound, and to know of me how I had dressed and treated it. The Emperor's physician bade me declare the essential nature of the wound, and what I had done for it. And all his assistants kept their ears wide open, to know if the wound were or were not mortal. I commenced my discourse to them, how M. de Martigues, looking over the wall to mark those who were sapping it, was shot with an arquebus through the body, and I was called of a sudden to dress him. I found blood coming from his mouth and from his wounds. Moreover, he had a great difficulty of breathing in and out, and air came whistling from the wounds, so that it would have put out a candle; and he said

he had a very great stabbing pain where the bullet had entered. I withdrew some scales of bone, and put in each wound a tent with a large head, fastened with a thread, lest on inspiration it should be drawn into the cavity of the chest; which has happened with surgeons, to the detriment of the poor wounded; for being fallen in, you cannot get them out; and then they beget corruption, being foreign bodies. The tents were anointed with a preparation of yolk of egg, Venice turpentine, and a little oil of roses. I put over the wounds a great plaster of diachylum, wherewith I had mixed oil of roses, and vinegar, to avoid inflammation. Then I applied great compresses steeped in oxycrate, and bandaged him, not too tight, that he might breathe easily. Next, I drew five basons of blood from his right arm, considering his youth and his sanguine temperament. Fever took him, soon after he was wounded, with feebleness of the heart. His diet was barley-water, prunes with sugar, at other times broth: his drink was a ptisane. He could lie only on his back. What more shall I say? but that my Lord de Martigues never had an hour's rest after he was wounded. These things considered, Gentlemen, no other prognosis is possible, save that he will die in a few days, to my great grief.

Having finished my discourse, I dressed him as I was accustomed. When I displayed his wounds, the physicians and surgeons, and other assistants present, knew the truth of what I had said. The physicians, having felt his pulse and seen that the vital forces were depressed and spent, agreed with me that in a few days he would die. Then they all went to the Duc de Savoie, and told him M. de Martigues would die in a short time. He answered them, Possibly, if he had been well dressed, he might have escaped death. Then they all with one voice said he had been very well dressed and cared for altogether, and it could not be better, and it was impossible to cure him, and his wound was of necessity mortal. Then M. de Savoie was very angry with them, and cried, and asked them again if for certain they all held his case hopeless: they answered, yes.

Then a Spanish impostor came forward, who promised on his life to cure him; and if he did not, they should cut him in an hundred pieces; but he would have no physicians, nor surgeons, nor apothecaries with him: and M. le Duc de Savoie forthwith bade the physicians and surgeons not go near M. de Martigues; and sent a gentleman to bid me, under pain of death, not so much as to touch him. Which I promised, and was very glad, for now he would not die under my hands; and the impostor was told to dress him, and to have with him no other physicians or surgeons, but only himself. By and bye he came, and said to M. de Martigues, Señor Cavallero, M. de Savoie has bid me come and dress your wound. I swear to God, before eight days I will set you on horseback, lance in hand, provided none touch you but I alone. You shall eat and drink whatever you like. I will be dieted instead of you; and you may trust me to perform what I promise. I have cured many who had worse wounds than yours. And the Seigneurs answered him, God give you His grace for it.

He asked for a shirt of M. de Martigues, and tore it in little strips, which he laid cross-wise, muttering and murmuring certain words over the wounds: having done this much for him, he let him eat and drink all he would, saying he himself would be dieted in his stead; which he did, eating but six prunes and six morsels of bread for dinner, and

drinking only beer. Nevertheless, two days later, M. de Martigues died: and my friend the Spaniard, seeing him at the point of death, eclipsed himself, and got away without goodbye to any man. And I believe if he had been caught he would have been hanged and strangled, for the false promise he made to M. le Duc de Savoie and many other gentlemen. M. de Martigues died about ten o'clock in the morning; and after dinner M. de Savoie sent the physicians and surgeons, and his apothecary, with a store of drugs to embalm him. They came with many gentlemen and captains of his army.

The Emperor's surgeon came to me, and asked me in a very friendly way to make the embalmment; which I refused, saying that I was not worthy to carry his instrument-box after him. He begged me again to do it to please him, and that he would be very glad of it. Seeing his kindness, and fearing to displease him, I then decided to show them the anatomist that I was, expounding to them many things, which would here be too long to recite . . . Our discourse finished, I embalmed the body; and it was placed in a coffin. Then the Emperor's surgeon drew me aside, and told me, if I would stop with him, he would treat me well, and give me a new suit of clothes, and set me on horseback. I gave him many thanks, and said I had no wish to serve any country but my own. Then he told me I was a fool, and if he were a prisoner as I was, he would serve a devil to get his freedom. In the end I told him flat I would not stop with him. The Emperor's physician then went back to M. de Savoie, and explained to him the causes of M. de Martigues' death, and that it was impossible for all the men in the world to have cured him; and assured him again I had done all that was to be done, and besought him to take me into his service; saying much more good of me than there was. He having been persuaded to do this, sent to me one of his stewards, M. du Bouchet, to tell me, if I would serve him, he would use me well; I sent back my very humble thanks, and that I had decided not to take service under any foreigner. When he heard my answer he was very angry, and said I ought to be sent to the galleys.

M. de Vaudeville, Governor of Graveline, and colonel of seventeen ensigns of infantry, asked him to send me to him, to dress an old ulcer on his leg, that he had had for six or seven years. M. de Savoie said he was willing, so far as I was concerned; and if I used the cautery to his leg, it would serve him right. M. de Vaudeville answered, if he saw me trying it, he would have my throat cut. Soon after, he sent for me four German halberdiers of his guard; and I was terrified, for I did not know where they were taking me: they spoke no more French than I German. When I was come to his lodging, he bade me welcome, and said, now I belonged to him; and so soon as I had healed him, he would let me go without ransom. I told him I had no means to pay any ransom. He called his physician and his surgeon-in-ordinary, to show me his leg; and when we had examined it, we withdrew into a room, where I began my discourse to them . . . Then the physician left me with the surgeon, and went back to M. de Vaudeville, and said he was sure I could cure him, and told him all I had decided to do; which pleased him vastly. He sent for me, and asked if I thought I could cure him; I said yes, if he were obedient to what was necessary. He promised to do only what I wished and ordered; and so soon as he was healed, he would let me go home without ransom. Then I asked

him to make better terms with me, saying it was too long to wait for my liberty: in fifteen days I hoped his ulcer would be less than half its present size, and give no pain; then his own surgeon and physician could finish the cure. He granted this to me. Then I took a piece of paper to measure the size of the ulcer, and gave it to him, and kept another by me; I asked him to keep his promise, when I had done my work; he swore by the faith of a gentleman he would. Then I set myself to dress him properly, after the manner of Galen . . . He wished to know if it were true, what I said of Galen, and bade his physician look to it, for he would know it for himself; he had the book put on the table, and found that what I said was true; so the physician was ashamed, and I was glad. Within the fifteen days, it was almost all healed; and I began to feel happy about the compact made between us. He had me to eat and drink at his table, when there were no more great persons than he and I only. He gave me a big red scarf which I must wear; which made me feel something like a dog when they give him a clog, to stop him eating the grapes in the vineyards. His physician and surgeon took me through the camp to visit their wounded; and I took care to observe what our enemy was doing. I found they had no more great cannons, but only twenty-five or thirty field-pieces.

M. de Vaudeville held prisoner M. de Baugé, brother of M. de Martigues who died at Hesdin. M. de Baugé was prisoner at Château de la Motte au Bois, belonging to the Emperor; he had been captured at Theroüenne by two Spanish soldiers; and M. de Vaudeville, when he saw him there, concluded he must be some gentleman of good family: he made him pull off his stockings, and seeing his clean legs and feet, and his fine white stockings, knew he was one to pay a good ransom. He told the soldiers he would give them thirty crowns down for their prisoner: they agreed gladly, for they had no place to keep him, nor food for him, nor did they know his value: so they gave their man into his hands, and he sent him off at once, guarded by four of his own soldiers, to Château de la Motte au Bois, with others of our gentlemen who were prisoners.

M. de Baugé would not tell who he was; and endured much hardship, living on bread and water, with a little straw for his bed. When Hesdin was taken, M. de Vaudeville sent the news of it to him and to the other prisoners, and the list of the killed, and among them M. de Martigues: and when M. de Baugé heard with his own ears his brother was dead, he fell to crying, weeping, and lamentation. His guards asked him why he was so miserable: he told them, for love of M. de Martigues, his brother. When he heard this, the captain of the castle sent straight to tell M. de Vaudeville he had a good prisoner: who was delighted at this, and sent me next day with four soldiers, and his own physician, to the castle, to say that if M. de Baugé would pay him fifteen thousand crowns ransom, he would send him home free: and he asked only the security of two Antwerp merchants that he should name. M. de Vaudeville persuaded me I should commend this offer to his prisoner: that is why he sent me to the castle. He told the captain to treat him well and put him in a room with hangings, and strengthen his guard: and from that time onward they made a great deal of him, at the expense of M. de Vaudeville.

M. de Baugé answered that he could not pay his ransom himself: it depended on M. d'Estampes his uncle, and Mlle. de Bressure his aunt: he had no means to pay such

a ransom. I went back with my guards, and gave this answer to M. de Vaudeville; who said, Possibly he will not get away so cheap : which was true, for they knew who he was. Then the Queen of Hungary and M. le Duc de Savoie sent word to M. de Vaudeville that this mouthful was too big for him, and he must send his prisoner to them (which he did), and he had other prisoners enough without him. The ransom paid was forty thousand crowns, without other expenses.

On my way back to M. de Vaudeville, I passed by Saint Omer, where I saw their great cannons, most of which were fouled and broken. Also I passed by Theroüenne, where I saw not one stone left on another, save a vestige of the great church: for the Emperor ordered the country people for five or six leagues round to clear and take away the stones; so that now you may drive a cart over the town: and the same at Hesdin, and no trace of castle and fortress. Such is the evil that wars bring with them.

To return to my story; M. de Vaudeville soon got the better of his ulcer, and was nearly healed: so he let me go, and sent me by a trumpet, with passport, as far as Abbeville. I posted from here, and went to find my master, King Henry, at Aufimon, who received me gladly and with good favour. He sent MM. de Guise, the Constable, and d'Estres, to hear from me the capture of Hesdin; and I made them a true report, and assured them I had seen the great cannons they had taken to Saint Omer: and the King was glad, for he had feared the enemy would come further into France. He gave me two hundred crowns to take me home: and I was thankful to be free, out of this great torment and thunder of the diabolical artillery, and away from the soldiers, blasphemers and deniers of God. I must add that after Hesdin was taken, the King was told I was not killed but taken prisoner. He made M. Goguier, his chief physician, write to my wife that I was living, and she was not to be unhappy, and he would pay my ransom.

Battle of Saint Quentin. 1557

AFTER the battle of Saint Quentin, the King sent me to La Fère en Tartenois, to M. le Maréchal de Bourdillon, for a passport to M. le Duc de Savoie, that I might go and dress the Constable, who had been badly wounded in the back with a pistol-shot, whereof he was like to die, and remained prisoner in the enemy's hands. But never would M. le Duc de Savoie let me go to him, saying he would not die for want of a surgeon; that he much doubted I would go there only to dress him, and not rather to take some secret information to him; and that he knew I was privy to other things besides surgery, and remembered I had been his prisoner at Hesdin. M. le Maréchal told the King of this refusal: who wrote to M. le Maréchal, that if Mme. the Constable's Lady would send some quickwitted man of her household I would give him a letter, and had also something to say to him by word of mouth, entrusted to me by the King and by M. le Cardinal de Lorraine. Two days later there came one of the Constable's gentlemen of the bedchamber, with his shirts and other linen, to whom M. le Maréchal gave a passport to go to the Constable. I was very glad, and gave him my letter, and instructed him what his master must do now he was prisoner.

I thought, having finished my mission, to return to the King; but M. le Maréchal begged me to stop at La Fère with him, to dress a very great number of wounded who had retreated there after the battle, and he would write to the King to explain why I stopped; which I did. Their wounds were very putrid, and full of worms, with gangrene, and corruption; and I had to make free play with the knife to cut off what was corrupt, which was not done without amputation of arms and legs, and also sundry trepannings. They found no store of drugs at La Fère, because the surgeons of the camp had taken them all away; but I found the waggons of the artillery there, and these had not been touched. I asked M. le Maréchal to let me have some of the drugs which were in them, which he did; and I was given the half only at one time, and five or six days later I had to take the rest; and yet it was not half enough to dress the great number of wounded. And to correct and stop the corruption, and kill the worms in their wounds, I washed them with Ægyptiacum dissolved in wine and eau-de-vie, and did all I could for them; but in spite of all my care many of them died.

There were at La Fère some gentlemen charged to find the dead body of M. de Bois-Dauphin the elder, who had been killed in the battle; they asked me to go with them to the camp, to pick him out, if we could, among the dead; but it was not possible to recognize him, the bodies being all far gone in corruption, and their faces changed. We saw more than half a league round us the earth all covered with the dead; and hardly stopped there, because of the stench of the dead men and their horses; and so many blue and green flies rose from them, bred of the moisture of the bodies and the heat of the sun, that when they were up in the air they hid the sun. It was wonderful to hear them buzzing; and where they settled, there they infected the air, and brought the plague with them. Mon petit maistre, I wish you had been there with me, to experience the smells, and make report thereof to them that were not there.

I was very weary of the place; I prayed M. le Maréchal to let me leave it, and feared I should be ill there; for the wounded men stank past all bearing, and they died nearly all, in spite of everything we did. He got surgeons to finish the treatment of them, and sent me away with his good favour. He wrote to the King of the diligence I had shown toward the poor wounded. Then I returned to Paris, where I found many more gentlemen, who had been wounded and gone thither after the battle.

The Journey to the Camp at Amines. 1558

THE KING sent me to Dourlan, under conduct of Captain Gouast; with fifty men-at-arms, for fear I should be taken by the enemy; and seeing we were always in alarms on the way, I made my man get down, and made him the master; for I got on his horse, which carried my valise, and could go well if we had to make our escape, and I took his cloak and hat and gave him my mount, which was a good little mare; he being in front, you would have taken him for the master and me for the servant. The garrison inside Dourlan, when they saw us, thought we were the enemy, and fired their cannon

at us. Captain Gouast, my conductor, made signs to them with his hat that we were not the enemy; at last they ceased firing, and we entered Dourlan, to our great relief.

Five or six days before this, a sortie had been made from Dourlan; wherein many captains and brave soldiers had been killed or wounded: and among the wounded was Captain Saint Aubin, *vaillant comme l'espée,* a great friend of M. de Guise: for whose sake chiefly the King had sent me there. Who, being attacked with a quartan fever, yet left his bed to command the greater part of his company. A Spaniard, seeing him in command, perceived he was a captain, and shot him through the neck with an arquebus. Captain Saint Aubin thought himself killed: and by this fright I protest to God he lost his quartan fever, and was forever free of it. I dressed him, with Antoine Portail, surgeon-in-ordinary of the King; and many other soldiers. Some died, others got off with the loss of an arm or a leg or an eye, and said they had got off cheap, to be alive at all. Then, the enemy having broken up their camp, I returned to Paris.

I say nothing here of *mon petit maistre,* who was more comfortable in his house than I at the wars.

The Journey to Bourges. 1562

THE KING with his camp was but a short time at Bourges, till those within the walls should surrender; and they came out with their goods saved. I know nothing worth remembering, but that a boy of the King's kitchen, having come near the walls of the town before the agreement had been signed, cried with a loud voice, Huguenot, Huguenot, shoot here, shoot here, having his arm thrown up and his hand spread out; a soldier shot his hand right through with a bullet. When he was thus shot, he came to find me to dress him. And the Constable seeing the boy in tears, with his hand all bloody, asked who had wounded him: then a gentleman who had seen him shot said it served him right, because he kept calling Huguenot, hit here, aim here. And then the Constable said this Huguenot was a good shot and a good fellow, for most likely if he had chosen to fire at the boy's head, he would have hit it even more easily than his hand. I dressed the kitchen boy, who was very ill. He recovered, but with no power in his hand: and from that time his comrades called him Huguenot : he is still living now

The Journey To Rouen. 1562

NOW, as for the capture of Rouen, they killed many of our men both before and at the attack: and the very next day after we had entered the town, I trepanned eight or nine of our men, who had been wounded with stones as they were on the breach. The air was so malignant, that many died, even of quite small wounds, so that some thought the bullets had been poisoned: and those within the town said the like of us; for though they had within the town all that was needful, yet all the same they died like those outside.

The King of Navarre was wounded, some days before the attack, with a bullet in the shoulder. I visited him, and helped to dress him, with one of his own surgeons, Master Gilbert, one of the chief men of Montpellier, and others. They could not find the bullet. I searched for it very accurately, and found reason to believe it had entered at the top of the arm, by the head of the bone, and had passed into the hollow part of the bone, which was why they could not find it; and most of them said it had entered his body and was lost in it. M. le Prince de la Roche-sur-Yon, who dearly loved the King of Navarre, drew me aside and asked if the wound were mortal. I told him yes, because all wounds of great joints, and especially contused wounds, were mortal, according to all those who have written about them. He asked the others what they thought of it, and chiefly Master Gilbert, who told him he had great hope his Lord the King would recover; which made the Prince very glad.

Four days later, the King, and the Queen-mother, and M. le Cardinal de Bourbon, his brother, and M. le Prince de la Roche-sur-Yon, and M. de Guise, and other great persons, after we had dressed the King of Navarre, wished us to hold a consultation in their presence, all the physicians and surgeons together. Each of them said what he thought, and there was not one but had good hope, they said, that he would recover. I persisted always in the contrary. M. le Prince, who loved me, drew me aside, and said I was alone against the opinion of all the others, and prayed me not to be obstinate against so many good men. I answered, When I shall see good signs of recovery, I will change my mind. Many consultations were held, and I never changed what I said, and the prognosis I had made at the first dressing, and said always the arm would fall into a gangrene, which it did, for all the care they could give to it; and he rendered his spirit to God the eighteenth day after his wound.

M. le Prince, having heard of it, sent to me his surgeon, and his physician, one Lefêvre, now physician-in-ordinary to the King and Queen-mother, to say he wished to have the bullet, and we were to look for it, to see where it was. Then I was very glad, and assured them I should quickly find it; which I did in their presence, with many other gentlemen: it was just in the very middle of the bone. M. le Prince took and showed it to the King and to the Queen, who all said that my prognosis had come true. The body was laid to rest at Château Gaillard: and I returned to Paris, where I found many patients, who had been wounded on the breach at Rouen, and chiefly Italians, who were very eager I should dress them: which I did willingly. Many of them recovered: the rest died. Mon petit maistre, I think you were called to dress some, for the great number there was of them.

The Battle of Dreux. 1562

THE DAY after the battle of Dreux, the King bade me go and dress M. le Comte d'Eu, who had been wounded in the right thigh, near the hip-joint, with a pistol-shot: which had smashed and broken the thigh-bone into many pieces: whereon many accidents supervened, and at last death, to my great grief. The day after I came, I would go to the

camp where the battle had been, to see the dead bodies. I saw, for a long league round, the earth all covered: they estimated it at twenty-five thousand men or more; and it was all done in less than two hours. I wish, mon petit maistre, for the love I bear you, you had been there, to tell it to your scholars and your children.

Now while I was at Dreux, I visited and dressed a great number of gentlemen, and poor soldiers, and among the rest many of the Swiss captains. I dressed fourteen all in one room, all wounded with pistol-shots and other diabolical firearms, and not one of the fourteen died. M. le Comte d'Eu being dead, I made no long stay at Dreux. Surgeons came from Paris, who fulfilled their duty to the wounded, as Pigray, Cointeret, Hubert, and others; and I returned to Paris, where I found many wounded gentlemen who had retreated thither after the battle, to have their wounds dressed; and I was not there without seeing many of them.

The Journey to Havre de Grace. 1563

AND I will not omit to tell of the camp at Havre de Grace. When our artillery came before the walls of the town, the English within the walls killed some of our men, and several pioneers who were making gabions. And seeing they were so wounded that there was no hope of curing them, their comrades stripped them, and put them still living inside the gabions, which served to fill them up. When the English saw that they could not withstand our attack, because they were hard hit by sickness, and especially by the plague, they surrendered. The King gave them ships to return to England, very glad to be out of this plague-stricken place. The greater part of them died, and they took the plague to England, and they have not got rid of it since. Captain

DURING the battle of Moncontour, King Charles was at Plessis-les-Tours, where he heard the news of the victory. A great number of gentlemen and soldiers retreated into the town and suburbs of Tours, wounded, to be dressed and treated; and the King and the Queen-mother bade me do my duty by them, with other surgeons who were then on duty, as Pigray, du Bois, Portail, and one Siret, a surgeon of Tours, a man well versed in surgery, who was at this time surgeon to the King's brother. And for the multitude of bad cases we had scarce any rest, nor the physicians either.

M. le Comte de Mansfeld, Governor of the Duchy of Luxembourg, Knight of the Order of the King, was severely wounded in the battle, in the left arm, with a pistol-shot which broke a great part of his elbow; and he withdrew to Borgueil near Tours. Then he sent a gentleman to the King, to beg him to send one of his surgeons, to help him of his wound. So they debated which surgeon they should send. M. le Maréchal de Montmorency told the King and the Queen that they ought to send him their chief surgeon; and urged that M. de Mansfeld had done much toward the victory.

The King said flat he would not have me go, and wished me to stop with himself. Then the Queen-mother told him I would but go and come back, and he must remember it was a foreign lord, who had come, at the command of the King of Spain, to help him. Then he let me go, provided I came back very soon. So he sent for me, and the

Queen-mother with him, and bade me go and find the Lord de Mansfeld, wherever he should be, to do all I could for him to heal his wound. I went to him, with a letter from Their Majesties. When he saw it, he received me with good-will, and forthwith dismissed three or four surgeons who were dressing him; which was to my very great regret, because his wound seemed to me incurable.

Now many gentlemen had retreated to Borgueil, having been wounded: for they knew that M. de Guise was there, who also had been badly wounded with a pistol-shot through the leg, and they were sure that he would have good surgeons to dress him, and would help them, as he is kindly and very generous, and would relieve their wants. This he did with a will, both for their eating and drinking, and for what else they needed: and for my part, they had the comfort and help of my art: some died, others recovered, according to their wounds. M. le Comte Ringrave died, who was shot in the shoulder, like the King of Navarre before Rouen. M. de Bassompierre, colonel of twelve hundred horse, was wounded by a similar shot, in the same place, as M. de Mansfeld: whom I dressed, and God healed. God blessed my work so well, that in three weeks I sent them back to Paris: where I had still to make incisions in M. de Mansfeld's arm, to remove some pieces of the bones, which were badly splintered, broken, and carious. He was healed by the grace of God, and made me a handsome present, so I was well content with him, and he with me; as he has shown me since. He wrote a letter to M. le Duc d'Ascot, how he was healed of his wound, and also M. de Bassompierre of his, and many others whom I had dressed after the battle of Moncontour; and advised him to ask the King of France to let me visit M. le Marquis d'Auret, his brother: which he did.

The Journey to Flanders. 1569

M. LE DUC D'ASCOT did not fail to send a gentleman to the King, with a letter humbly asking he would do him so much kindness and honour as to permit and command his chief surgeon to visit M. le Marquis d'Auret, his brother, who had received a gunshot wound near the knee, with fracture of the bone, about seven months ago, and the physicians and surgeons all this time had not been able to heal him. The King sent for me and bade me go and see M. d'Auret, and give him all the help I could, to heal him of his wound. I told him I would employ all the little knowledge it had pleased God to give me.

I went off, escorted by two gentlemen, to the Chateau d'Auret, which is a league and a half from Mons in Hainault, where M. le Marquis was lying. So soon as I had come, I visited him, and told him the King had commanded me to come and see him and dress his wound. He said he was very glad I had come, and was much beholden to the King, who had done him so much honour as to send me to him.

I found him in a high fever, his eyes deep sunken, with a moribund and yellowish face, his tongue dry and parched, and the whole body much wasted and lean, the voice low as of a man very near death: and I found his thigh much inflamed, suppurating, and ulcerated, discharging a greenish and very offensive sanies. I probed it with a silver

probe, wherewith I found a large cavity in the middle of the thigh, and others round the knee, sanious and cuniculate: also several scales of bone, some loose, others not. The leg was greatly swelled, and imbued with a pituitous humor and bent and drawn back. There was a large bedsore; he could rest neither day nor night; and had no appetite to eat, but very thirsty. I was told he often fell into a faintness of the heart, and sometimes as in epilepsy: and often he felt sick, with such trembling he could not carry his hands to his mouth. Seeing and considering all these great complications, and the vital powers thus broken down, truly I was very sorry I had come to him, because it seemed to me there was little hope he would escape death. All the same, to give him courage and good hope, I told him I would soon set him on his legs, by the grace of God, and the help of his physicians and surgeons.

Having seen him, I went a walk in a garden, and prayed God He would show me this grace, that he should recover; and that He would bless our hands and our medicaments, to fight such a complication of diseases. I discussed in my mind the means I must take to do this. They called me to dinner. I came into the kitchen, and there I saw, taken out of a great pot, half a sheep, a quarter of veal, three great pieces of beef, two fowls, and a very big piece of bacon, with abundance of good herbs: then I said to myself that the broth of the pot would be full of juices, and very nourishing.

After dinner, we began our consultation, all the physicians and surgeons together, in the presence of M. le Duc d'Ascot and some gentlemen who were with him. I began to say to the surgeons that I was astonished they had not made incisions in M. le Marquis' thigh, seeing that it was all suppurating, and the thick matter in it very fœtid and offensive, showing it had long been pent up there; and that I had found with the probe caries of the bone, and scales of bone, which were already loose. They answered me: Never would he consent to it ; indeed, it was near two months since they had been able to get leave to put clean sheets on his bed; and one scarce dared touch the coverlet, so great was his pain. Then I said, To heal him, we must touch something else than the coverlet of his bed. Each said what he thought of the malady of the patient, and in conclusion they all held it hopeless. I told them there was still some hope, because he was young, and God and Nature sometimes do things which seem to physicians and surgeons impossible.

To restore the warmth and nourishment of the body, general frictions must be made with hot cloths, above, below, to right, to left, and around, to draw the blood and the vital spirits from within outward. For the bedsore, he must be put in a fresh, soft bed, with clean shirt and sheets. Having discoursed of the causes and complications of his malady, I said we must cure them by their contraries; and must first ease the pain, making openings in the thigh to let out the matter. Secondly, having regard to the great swelling and coldness of the limb, we must apply hot bricks round it, and sprinkle them with a decoction of nerval herbs in wine and vinegar, and wrap them in napkins; and to his feet, an earthenware bottle filled with the decoction, corked, and wrapped in cloths. Then the thigh, and the whole of the leg, must be fomented with a decoction made of sage, rosemary, thyme, lavender, flowers of chamomile and melilot, red roses boiled in white

wine, with a drying powder made of oak-ashes and a little vinegar and half a handful of salt. Thirdly, we must apply to the bedsore a large plaster made of the desiccative red ointment and of Unguentum Comitissœ, equal parts, mixed together, to ease his pain and dry the ulcer; and he must have a little pillow of down, to keep all pressure off it. And for the strengthening of his heart, we must apply over it a refrigerant of oil of water-lilies, ointment of roses, and a little saffron, dissolved in rose-vinegar and treacle, spread on a piece of red cloth. For the syncope, from exhaustion of the natural forces, troubling the brain, he must have good nourishment full of juices, as raw eggs, plums stewed in wine and sugar, broth of the meat of the great pot, whereof I have already spoken; the white meat of fowls, partridges' wings minced small, and other roast meats easy to digest, as veal, kid, pigeons, partridges, thrushes, and the like, with sauce of orange, verjuice, sorrel, sharp pomegranates; or he may have them boiled with good herbs, as lettuce, purslain, chicory, bugloss, marigold, and the like. At night he can take barley-water, with juice of sorrel and of water-lilies, of each two ounces, with four or five grains of opium, and the four cold seeds crushed, of each half an ounce; which is a good nourishing remedy and will make him sleep. His bread to be farm-house bread, neither too stale nor too fresh. For the great pain in his head, his hair must be cut, and his head rubbed with rose-vinegar just warm, and a double cloth steeped in it and put there; also a foreheadcloth, of oil of roses and water-lilies and poppies, and a little opium and rose-vinegar, with a little camphor, and changed from time to time. Moreover, we must allow him to smell flowers of henbane and water-lilies, bruised with vinegar and rose-water, with a little camphor, all wrapped in a handkerchief, to be held some time to his nose. And we must make artificial rain, pouring water from some high place into a cauldron, that he may hear the sound of it; by which means sleep shall be provoked on him. As for the contraction of his leg, there is hope of righting it when we have let out the pus and other humors pent up in the thigh, and have rubbed the whole knee with ointment of mallows, and oil of lilies, and a little eau-de-vie, and wrapped it in black wool with the grease left in it; and if we put under the knee a feather pillow doubled, little by little we shall straighten the leg.

This my discourse was well approved by the physicians and surgeons.

The consultation ended, we went back to the patient, and I made three openings in his thigh. Two or three hours later, I got a bed made near his old one, with fair white sheets on it; then a strong man put him in it, and he was thankful to be taken out of his foul stinking bed. Soon after, he asked to sleep; which he did for near four hours: and everybody in the house began to feel happy, and especially M. le Duc d'Ascot, his brother.

The following days, I made injections, into the depth and cavities of the ulcers, of Ægyptiacum dissolved sometimes in eau-de-vie, other times in wine. I applied compresses to the bottom of the sinuous tracks, to cleanse and dry the soft spongy flesh, and hollow leaden tents, that the sanies might always have a way out; and above them a large plaster of Diacalcitheos dissolved in wine. And I bandaged him so skilfully that he had no pain; and when the pain was gone, the fever began at once to abate. Then I

gave him wine to drink moderately tempered with water, knowing it would restore and quicken the vital forces. And all that we agreed in consultation was done in due time and order; and so soon as his pains and fever ceased, he began steadily to amend. He dismissed two of his surgeons, and one of his physicians, so that we were but three with him.

Now I stopped there about two months, not without seeing many patients, both rich and poor, who came to me from three or four leagues round. He gave food and drink to the needy, and commended them all to me, asking me to help them for his sake. I protest I refused not one, and did for them all I could, to his great pleasure. Then, when I saw him beginning to be well, I told him we must have viols and violins, and a buffoon to make him laugh: which he did. In one month, we got him into a chair, and he had himself carried about in his garden and at the door of his château, to see everybody passing by.

The villagers of two or three leagues round, now they could have sight of him, came on holidays to sing and dance, men and women, pell-mell for a frolic, rejoiced at his good convalescence, all glad to see him, not without plenty of laughter and plenty to drink. He always gave them a hogshead of beer; and they all drank merrily to his health. And the citizens of Mons in Hainault, and other gentlemen, his neighbours, came to see him for the wonder of it, as a man come out of the grave; and from the time he was well, he was never without company. When one went out, another came in to visit him; his table was always well covered. He was dearly loved both by the nobility and by the common people; as for his generosity, so for his handsome face and his courtesy: with a kind look and a gracious word for everybody, so that all who saw him had perforce to love him.

The chief citizens of Mons came one Saturday, to beg him let me go to Mons, where they wished to entertain me with a banquet, for their love of him. He told them he would urge me to go, which he did; but I said such great honour was not for me, moreover they could not feast me better than he did. Again he urged me, with much affection, to go there, to please him: and I agreed. The next day, they came to fetch me with two carriages: and when we got to Mons, we found the dinner ready, and the chief men of the town, with their ladies, who attended me with great devotion. We sat down to dinner, and they put me at the top of the table, and all drank to me, and to the health of M. le Marquis d'Auret: saying he was happy, and they with him, to have had me to put him on his legs again; and truly the whole company were full of honour and love for him. After dinner, they brought me back to the Château d'Auret, where M. le Marquis was awaiting me; who affectionately welcomed me, and would hear what we had done at our banquet; and I told him all the company had drunk many times to his health.

In six weeks he began to stand a little on crutches, and to put on fat and get a good natural colour. He would go to Beaumont, his brother's place; and was taken there in a carrying-chair, by eight men at a time. And the peasants in the villages through which we passed, knowing it was M. le Marquis, fought who should carry him, and would have us drink with them; but it was only beer. Yet I believe if they had possessed wine,

even hippocras, they would have given it to us with a will. And all were right glad to see him, and all prayed God for him.

When we came to Beaumont, everybody came out to meet us and pay their respects to him, and prayed God bless him and keep him in good health. We came to the château, and found there more than fifty gentlemen whom M. le Duc d'Ascot had invited to come and be happy with his brother; and he kept open house three whole days. After dinner, the gentlemen used to tilt at the ring and play with the foils, and were full of joy at the sight of M. d'Auret, for they had heard he would never leave his bed or be healed of his wound. I was always at the upper end of the table, and everybody drank to him and to me, thinking to make me drunk, which they could not; for I drank only as I always do.

A few days later, we went back; and I took my leave of Mdme. la Duchesse d'Ascot, who drew a diamond from her finger, and gave it me in gratitude for my good care of her brother: and the diamond was worth more than fifty crowns. M. d'Auret was ever getting better, and was walking all alone on crutches round his garden. Many times I asked him to let me go back to Paris, telling him his physician and his surgeon could do all that was now wanted for his wound: and to make a beginning to get away from him, I asked him to let me go and see the town of Antwerp. To this he agreed at once, and told his steward to escort me there, with two pages. We passed through Malines and Brussels, where the chief citizens of the town begged us to let them know of it when we returned; for they too wished, like those of Mons, to have a festival for me. I gave them very humble thanks, saying I did not deserve such honour. I was two days and a half seeing the town of Antwerp, where certain merchants, knowing the steward, prayed he would let them have the honour of giving us a dinner or a supper: it was who should have us, and they were all truly glad to hear how well M. d'Auret was doing, and made more of me than I asked.

On my return, I found M. le Marquis enjoying himself: and five or six days later I asked his leave to go, which he gave, said he, with great regret. And he made me a handsome present of great value, and sent me back, with the steward, and two pages, to my house in Paris.

I forgot to say that the Spaniards have since ruined and demolished his Château d'Auret, sacked, pillaged, and burned all the houses and villages belonging to him: because he would not be of their wicked party in their assassinations and ruin of the Netherlands.

I have published this Apologia, that all men may know on what footing I have always gone: and sure there is no man so touchy not to take in good part what I have said. For I have but told the truth; and the purport of my discourse is plain for all men to see, and the facts themselves are my guarantee against all calumnies.

AN ACCOUNT OF THE SORE THROAT ATTENDED WITH ULCERS

A Disease Which Hath of Late Years Appeared in This City, and the Parts Adjacent

John Fothergill, M. D.,
Fellow of the Royal College of Physicians of Edinburgh

This work published in 1748, by John Fothergill (1712-1780) was a serious discussion of diptheria. He was known as a great physician, botanist, and a friend of Benjamin Franklin (1706-1790). Fothergill displayed great skill in his clinical descriptions, but reading this today we see he failed to distinguish there was a difference between diptheria and scarlet fever. However, his contribution should be acknowledged as a very important physical finding in early medicine. The original monograph was published by *C. Davis, London,* MDCCXLVIII, in 1748. (White 2009)

PREFACE

A SIMPLE inflammation of the tonsils, or of other parts about the fauces, from its frequently happening without any considerable hazard attending it, is commonly looked upon as a troublesome, rather than a dangerous disease: And every one, how little soever conversant in the practice of physic, thinks himself qualified to conduct the patient thro' it with safety.

If a person complains of pain in his throat upon swallowing, with the symptoms of a fever, nothing is thought more expedient, or more frequently ordered, than bleeding, purging, and such medicines as are daily observed to remove inflammations in general: And in simple inflammations this method is warranted to be just, by reason and experience.

But a disease hath of late years appeared in this city, in many of the neighbouring villages, and according to the best information I have been able to procure, in several other parts of this nation; which, tho' it may be taken for a common sore throat, or a simple inflammation of the tonsils, by those who are unacquainted with it, is of a very different nature from the common one, and requires to be treated in as different a

method: For it has been found by experience, that those measures, which seldon fail of answering the prescriber's expectation in this case, frequently produce the most unhappy consequences in the other, and render a disease almost certainly fatal, which of itself is not often so, in this country.

Some instances of mistakes in this respect have not long since fallen under my observation; and there is still a possibility of the like happening, as the same disorder continues amongst us: It seems therefore necessary, that some endeavours should be used to prevent them; and that such a description of the disease should be made public, as might enable practitioners, who have not seen or known it, to distinguish it from that to which it bears some resemblance; together with an account of the method of treating it, which hath in general been attended with success.

There are several of the faculty, who, I readily acknowledge, have it more in their power to give the public satisfaction on this subject, than I have; but their constant engagements in the duties of their profession, will probably hinder those who are most equal to the task, from executing it so speedily as public utility requires: Wherefore, as some information relative to it seems immediately wanted in several places, the following, tho' less perfect, will perhaps in the mean time be neither unacceptable, nor wholly useless.

If any thing in these sheets should appear, to those who may be better acquainted with the subject, to be inaccurate, or premature; if some things of little weight should seem too largely insisted on, whilst others of more consequence are neglected, this apology will, I hope, be admitted; vis. that to have delayed the publication of this essay, till it had received those advantages that further observations might have added, would have frustrated my design; which was, to prevent, as much as possible, the mistakes that might happen in relation to this disease, by speedily communicating the remarks, which the instances I had seen had afforded.

As this disease appears to be the same with that which raged in Spain, Italy, and the neighbouring countries, somewhat more than a century ago; it may not be improper, in the first place, to give some account of it, from such of the authors who then wrote upon it, as have come to my hands, previous to a description of the same distemper, as it now appears in this country.

Tis said, that a similar, if not the same disease hath long been insome of our American Colonies, and the West-India Islands; but as I have met with no accounts of it from such as were competent judges, it must be left to time, and further inquiries, to determine the truth or falsity of the report.

London, Dec. 1. 1748.

OF THE SORE THROAT ATTENDED WITH ULCERS

As It Appeared in Spain, Italy, Sicily, &c.

The disease which is called by the Spaniards Garrotillo', by the Italians, and other nations, Morbus strangulatorius, Pestilens Faucium Affectus, Epidemica Gutturis Lues,

and by divers other appellations2, is said to have appeared first in Spain about the year 1610, to have spread from thence to Malta, Sicily, Otranto, Apulia, Calabria, and the Campagnia, in the space of a few years; and to have broke out at Naples in 1618, where it continued upwards of 20 years ravaging the different parts of the kingdom[s].

It is not certainly known how much longer it remained in these countries, or to what others it was communicated at that time, its declension being as obscure as the causes it sprung from. That it wholly disappeared in these parts, soon after the time above-mentioned, seems probable, from the silence of those physicians, who have published their observations made in the places, which had so severely felt the effects of this distemper.

Several writers, as Wierus*, Forrestus5, Ramazzini[6], and others, take notice of epidemic affections of the throat, in some respects resembling the disease here described; but a little attention to the symptons of each, will, I think, discover an essential difference between them. The same I think may be said of the sore throat and scarlet fever, which shewed itself at Edinburgh in 1737.

Tournefort, in his Voyage to the Levant[8], seems to have met with this disease in the islands of the archipelago; at least so far as one can judge from the imperfect description we have of it. His account is as follows.

"When we were in this Island (Milo) there raged a terrible distemper, not uncommon in the Levant: It carries off children in twice 24 hours: It is a carbuncle or plage-sore in the bottom of the throat, attended with a violent fever. This malady, which may be called the child's plague, is epidemical, tho' it spares adult people. The best way to check the progress of it, is to vomit the child the moment he is perceived to grow heavy-headed. This remedy must be repeated, according as there is occasion, in order to evacuate a sort of Aqua fortis, that discharges itself on the throat. It is necessary to support the circulation of the juices, and the strength of the patient, with spirituous things; such as the Theriaca, Spri. vol. oleos. aromat. and the like. The solution of Liquid styrax in brandy is an excellent gargarism upon this occasion. Tho' it is a case that requires the greatest dispatch, the Levantines are seldom much in haste in the cure of any disease."

This account does not disagree in general with that which has been left us of the Morbus strangulatorius; only he is singular in asserting it to arise from a kind of Aqua fortis discharged upon the parts: But his favorite study had engrossed his attention, and to this we must impute both the present mistake, and his want of accuracy and precision too frequently, when he treats upon medical subjects.

When it first broke out in the countries above-mentioned, it soon engaged the physicians of those times, as well to observe its nature, effects, and whatever might contribute to its cure, as to vindicate their respective systems and opinions; and out of such of the tracts then published as I have had an opportunity of perusing, the following account of it, as it appeared at that time, has been collected.

Ludovicus Mercatus, physician to Philip II and III, Kings of Spain, among his consultations, published in Tome V of his Works9, has one upon this disease[t0]: He mentions it as a calamity which had but newly appeared, and at that time affected several

provinces and cities of that kingdom: He has related only one case; but, in commenting upon it, according to the method of writing on diseases then in use, he takes notice of several circumstances relative to it, and makes some observations respecting the cure, which, tho' they seem to have been neglected by many who succeeded him, experience hath since shewn to be just; some of these will be pointed out in their proper places: And, considering that he wrote very soon after the distemper broke out, the approbation prefixed to this part of his work being dated in 1612, they are a proof of his attention and sagacity.

Johannes Andreas Sgambatus, a physician of Naples, published a treatise upon this subject in 1620[n]. He gives us a methodical and pretty exact history of the symptoms, and method of cure both general and topical, together with a summary view of the disputes, which at that time were managed with sufficient heat and acrimony, in relation to its name, cause, and nature; about which they were as much divided as they were about the method of cure; each party appealing to Hippocrates, Galen, Avicenna, &c. for the support of their opinions concerning a disease, which it is not certain that those whom they appeal to ever saw.

Johannes Baptista Cortesiu, in his Miscellanea medica'Q, takes notice of this disease, and describes its principal symptoms, in a letter to Jo. Anton. Anguilloni, physician in chief to the Maltese Gallies. He considers it indeed as a different distemper from that which infested Naples and other parts of Italy; tho', from his own account of it, there appears little reason to question its being the same. He seems to have been led into this mistake, by considering the disease he treats of, contagious only in a certain limited sense, whilst the Italians, as some of the Spaniards had also done, declared theirs to be pestilential and contagious without restriction. He al-lows, that the breath of a person affected might convey the contagious effluvia to another near at hand; and gives an instance of one who got the disease, and died of it, by trying, at his friend's request, who then laboured under this disease, if his breath was affected[1s]: for from this circumstance they guessed at the degree of danger attending them.

In 1636, Aetius Cletus, of Signia in Italy, published his Treatise De morbo strangulatorio.'* He mentions some facts relating to it, that had escaped Sgambatus and Cortesius, which will be taken notice of hereafter.

Marcus Aurelius Severinus, Professor of Anatomy and Surgery, and Physician to the Hospital of Incurables at Naples, wrote a dissertation upon this disease, under the title of Paedanchone Loimodes, seu de pestilente ac praefocante Pueros Abscessu; and annexed it to the second edition of his book De recondita Abscessuum Natura, which was printed in 1643[s]. From a person of his capacity, and furnished with the best opportunities of seeing the disease in every stage and condition, we might reasonably have expected such observations as would enable one to form a just idea of this distemper, but we meet with little of this kind in his performance. He has indeed mentioned some circumstances relating to its history, not taken notice of by the other writers I have seen, and his method of cure is different from the rest; but he refers us to others for an account of the symptoms, and contents himself with reciting and commenting upon Aretaeus's

description of the Ulcera Syriaca, which he takes for granted to be the same with the disease which at that time infested Naples.

One might justly expect some curious observations upon this disease, from a person so well qualified for it as Thomas Bartholine: He was in Italy whilst it raged there, and it might be supposed, would be attentive to the minutest circumstance relating to it, and be inquisitive enough to know what men of character had said upon it. But the treatise which he wrote upon this disease, and published in 1646, contains so little to the purpose, that it is difficult to conceive for what end it was wrote, unless to compliment his Master Severinus, which he does very liberally.13

In his partibus (scil. faucibus) ex humoris virulenti affluxu gignuntur carbuncolasae inflammationes, quae pestis dirae, aut veneni promptissimi instar, contagio quodam, pueros et adultos corripiunt; et saevis maleficentissimisque stipatae symptomatis citissimam necem inferre solent. Malum in Hispania non multis abhinc annis frequens, vulgus medicorum Hispano sermone Garrotillo nuncupat; de cujus essentia, periculo, brevitate, et complicatione ustivi et ulcerosi tumoris, ac deleteria corruption, laconice dicam. Hoc fuit pressus biennis infans, sanguineus et obesus. Primo die ex catarrhosa defluxione in suffocationem pene incurrit, difficulter respirabat, et lac deglutiebat, et febri acuta affectus, nec plorare poterat. In parte gutturis dextra externa glandulosus apparuit tumor cum dolore multo. Secundo die infra fauces ulcus visum est ad nigrum vergens, quod putrilago et mollifies multa comitabantur; at ab ore faetor horribilis prodibat, magnum certe corruptionis completae indicium. Tertio die nullis adjutus auxiliis strangulatus est extinctus. De praxi medic. admiranda, lib. i. observ. 90.

According to the accounts which have been left us by these authors, it appears, that the disease which they describe was extremely malignant, and most particularly fatal to children; tho᾽ adults, if they were much conversant about the sick, were very often seized with it; yet more of these recovered in proportion than of children; and it was observed, that more boys got well through the disease than girls: Some thought, that such of this sex as had black eyes suffered more from it than others.

As it was sometimes observed to carry off whole families together, and to spread to those places first, between which and the countries affected by it the communication was most frequent; and also that children, sent away from the towns where it raged, in order to avoid it, escaped whilst they were kept at a distance, but had it on their return, if the disease was not extinguished; it was almost universally allowed to be contagious.

Those who were seized with it, first complained of a pain or soreness in the throat, with a stiffness of the neck, an uneasiness on moving it, as if a cord was twisted about it, a difficulty in swallowing, and frequently in breathing also, with a disagreeable fetid smell and taste. On inspection, the uvula, the tonsils, pharynx, and the whole fauces, appeared of a remarkably florid red colour, like that attending an erysipelas: This colour was not uniformly intense, but some parts seemed to be of a deeper dye than others. The parts above-mentioned were swelled more or less, tho᾽ not always so much as to affect respiration, as in a common angina.

If the attack was violent, they had an extreme difficulty in breathing, and also in swallowing; with a kind of compressive pain and straitness of the breast and back, a redness of the whole face and neck, great heat of all the parts affected, depravation of the voice, an unquenchable thirst, and the patient seemingly in danger of being choaked[19]. In some, the swelling and ulcers of the fauces were apparent upon looking into the mouth; in others, nothing could be seen, but a most offensive putrid smell was perceivable. A fever came on with the other symptoms, and was frequently accompanied with small pimples and eruptions like flea-bites. In very bad cases, this fever, which Mericatus calls a most malignant one'0, did not always discover its violence or malignity at first; but it was not the less formidable on this account."

On the same day, or the day following, such parts of the fauces as at first seemed to be of a deeper colour than the rest, turned white, ash-coloured, or black; this was not occasioned by any crust or matter superinduced upon the parts, but proceeded from a gangrenous colliquation of them, the substance itself being mortified.

The voice was hoarse and obscure; not as in a common cold, but as it is in those people who have venereal ulcers in the throat: So that, from this circumstance alone, some were able to guess at the disease.

The neck and throat soon after began to swell externally; the tumour was of a soft aedematous kind, and increased in magnitude as the disease advanced. All the symptoms were aggravated during the night. If the patients had any interval of quiet, it was commonly in the day-time.[n] About the fourth day this tumour was generally grown very large, and the white places in the fauces began to turn black; a putrid corrosive sanies was discharged by the mouth and nostrils;[2]4 the breath grew extremely offensive; respiration, if hitherto not much affected, now became difficult, and the patient expired in a very short time.

Tho' this was the common progress of the disease, where it terminated unhappily, yet it often varies from this type, and was attended with very different symptoms. Some had an extreme difficulty of breathing almost from the first; some had a violent cough; some were comatous; others had a delirium; some died in a lethargic stupor; others bled to death at the nose; whilst others again had none of these symptoms, but were carried off suddenly by an instantaneous suffocation. The oesophagus in some was sphacelated to the stomach; the Aspera arteria, in others, to the lungs: As these could only breath in an erect position; so those could swallow nothing when the parts were so affected. The nostrils discharged a fetid ichor, sometimes mixed with blood; and sometimes blood alone, without mixture. This bleeding at the nose seemed at first, in one case, to give relief; but the patient soon after died. Mercatus relates an instance of a child that had the disease, in which the acrimony of the humour discharged from the ulcers was so great as to inflame the nurse[s] breast, and brought on a mortification. He also tells us, that the father of the child whose case is described above, having frequently put his finger is the child[s] mouth, to draw out the viscid phlegm, had his finger inflamed, and was seized with the same distemper.

These were the symptoms in general, and they judged of the event by mildness of their progress, or the contrary: Tho' it was agreed, that nothing could be more

fallacious than this disease; and that the most experienced were often deceived in their prognostic.

If the redness of the fauces above described, which appeared at the first being seized, was succeeded by an ulceration, without any of that whiteness (which for the future I shall call sloughs), if the swelling about the neck and throat was not large, if the patient discharged by the mouth considerable quantities of thin pituitous matter, if the breath was not fetid, and the patient had no disgust to his food, if the eyes retained their proper lustre, all was judged to be secure.

On the other hand, if this lustre was in any degree faded", if the external oedematous tumour was very large, if the breath stunk, if the fauces were livid or black, with a coma or delirium, if with these the patient had an aversion to his nourishment, and his breathing became difficult or laborious, the danger was judged to be extreme.

It was not observed that the disease had any stated crisis; or that the signs of recovery, or death, appeared on any certain day. Some died on the first, others on the second, third, and on every day, to the seventh; tho' the greatest part died before the fourth." Those who survived the fourteenth, were thought to be out of danger, at least from the disease itself;" though some dropped off unexpectedly, after a much longer reprieve.

The consequences of this disease were often felt a long time after it had ceased: An excessive languor and weakness continued for many months; and the voice or deglutition was frequently affected, so as to be perceivable in some almost a year after.

It was however observed, that notwithstanding the disease most frequently was accompanied with symptoms of pestilential malignity, yet it sometimes appeared with a much more favourable aspect; its progress not being so quick, nor its symptoms so violent and dangerous, as bath here been described to be the case in general.[3E] At its first breaking out in any place it was commonly the most severe; it then spared no age or sex, but swept off adults together with infants:33 By degrees it became less violent, and at length either wholly disappeared, or was of so little consequence as to be disregarded.

We are directed, by most of the authors I have seen, to begin the cure of this distemper, whenever we are called in time, with evacuations; the chief whereof are bleeding and purging: Which of the two ought to precede was not a little disputed; but it was on all hands agreed, that unless these remedies were very early applied, as they were principally useful by way of revulsion, they were not only of no advantage to the patient, but highly injurious.[34] An observation of this kind, we are told", induced several physicians to omit bleeding entirely; and it was, probably, the reason why those who were friends to venesection directed it more sparingly in this, than in most other acute diseases38. Severinus, who was by no means a timid operator, orders from four to eight ounces to be taken away; which, considering the common practice in those countries, is a very small quantity.

Some not only gave the precedence to purging, but imagined it alone was sufficient; alledging, as a reason for it, that some children had recovered, where this evacuation only had been employed; whilst bleeding had been injurious, by lessening the strength.38 Purging was however commonly allowed the second place, by those who were advocates

for bleeding, but under the like restrictions.[39] They generally made use of manna, rhubarb, senna, tamarinds, syrup of roses, and the like, for this purpose. But it was always inculcated, that, in directing these evacuations, the patient's strength was especially to be regarded; since whatever diminished this, in the end was undoubtedly prejudicia1.

Severinus orders an antimonial vomit to be given at the first attack, and a cooling gently astringent gargle to be used night and day. He then directs a clyster, takes away some blood from the jugular, and gives from xv to xxi grains of bezoar mineral twice a day, or oftener, as occasion requires, with thin duluting liquors, in order to raise and promote a moderate sweat. He gives five or six grains of the same medicine to children at the breast, and commends it highly. He sacrifices the discoloured parts in the fauces, in order to let out the corrosive virus; a practice, which, though it was recommended by the Spaniards, was disliked by some of the most eminent Italians.

Cupping, with scarification, was universally approved, and commonly practised. Leeches were also applied, by way of revulsion, to different parts.

Considerable benefit was expected from ligatures made on the extremities, and from chafing the limbs with the hand, or a cloth; also from cupping without scarification; apprehending that a revulsion from the parts affected was by this means procured; and that some portion of the morbific matter was carried off by the pores of the skin.

Some of the Spanish physicians recommended vesicatories of cantharides, and other acrid caustic substances, to be laid on each side of the neck; but they had not the same opinion of their usefulness, when applied to the back or shoulders: Heredia expressly tells us, that he had seldom found any benefit from them*': Neither do the Italian physicians seem to have been fond of them; the progress of the disease was, in their opinion, too swift to admit of any relief from either caustics or vesicatories," both which had been made use of in Spain.

To moderate the continual and malignant fever, which accompanied this disease from the first, and which was thought by some to be only symptomatical, and had therefore the last place in their consideration, they had recourse to such internal medicines as were deemed coridal and alexipharmac. Armenian Bole, Bezoar both animal and mineral, and according the philosophy of those times, the precious stones, were reckoned of this class. Of vegetable products, the juices of citrons, lemons, oranges, pomegranates, and sorrel; vinegar, the juice and decoctions of borage, bugloss, carduus benedictus, endive, scabious, scorzonera, scordium, with many others of the like nature, were recommended. But a decoction of the contrayerva root was in the highest esteem, both for its great use as an alexipharmac in general in this disease, and its particular efficacy, when applied as a gargle to the throat; of which Mercatus, from his own repeated observations, gives a very ample testimony.

But as they found from experience, that no regular crisis or concoction of the humours was to be waited for; that no evacuations, except by way of revulsion, after the access, were of use*, they began to consider the disease as local, a peculiar morbid affection of the fauces, and applied themselves chiefly to topics, without laying much stress on internals.

In this part of their directions they have therefore been more explicit; and some of them, in order to point out their applications with more propriety, have divided the course of this disease into four different periods.

The first they called the state of inflammation. In this mild repellents were thought necessary; such as vinegar in barley water, juice of pomegranate, syrup of roses, mulberries, purslaim, or a decoction of barley, red roses, liquorice, and plantain; to two pounds of which were added Acet. Ros. iss. Syr. Diamor. i. M^{s}'. If it was required yet more repellent, a small quantity of alum was added.

The second stage is that wherein the white sloughs begin to appear, which is a step towards a gangrenous colliquation. In this they ordered mild abstergents and antiputrescents; such as a decoction of lupins, beans, vetches, with honey of roses.

The third is, when the ulcers appear foul and sordid, and begin to look black, a real mortification being come on, sometimes penetrating to a considerable depth, with great putrefaction. More powerful astringents and exsiccants were requisite in this case; such as powder of myrrh, and a little alum mixed with honey, or honey of roses Bole dissolved in treacle-water, a solution of Unguent. Aegyptiacum in barley water was also much in use, 53 alum, sulphur, copperas, verdigrise, oil of vitriol, oil of sulphur, spirit of salt alone, or mixed, or diluted in different liquors, were much employed. In this case, sometimes the acid were dextrously applied to the parts affected by means of an armed probe; but they were often diluted with syrup or honey of roses, and in children poured into the mouth.

Tho' many had recourse to these powerful remedies, and even to arsenic itself, yet the most experienced were justly afraid, that the use of such caustic and acrimonious applications was often attended with pernicious consequences, both to children and adults; and they are therefore, with great reason, condemned by Mercatus.

Nevertheless some went so far as to advise the actual cautery, if the potential ones did not succeed, and give directions for the time and manner of their applications ;63 but as this operation will be liable to all the objections made to the former, to have mentioned it will, I imagine be thought sufficient.

Tho' the author last quoted advises us to scarify the black or livid crusts or sloughs, yet he gives us a caution not to tear them off, or forcibly, separate them, as the consequences would be an increase of pain, and inflammation; whence the ulcers would spread, and at the same time eat deeper."

In the fourth stage the putrefaction is supposed to be extinguished, the mortified parts cast off, and an ulcer only remains. In this case, the fume of white amber thrown on live coals, and received into the mouth, as a suffitus, was advised; also the vinum myrrhites, a decoction of guaiacum, roses, balaustines, pomegranate-peels, by way of gargle, medicines that were supposed to dry with some degree of astringency.

Such was the appearance of this disease at its first being taken notice of in Europe; and such, as far as I can collect, the methods of cure pursued by the authors above-mentioned.

The disease which is described in the following pages, appears to be the same with the Angina maligna, or strangulatory affection of the fauces of these writers, and seems

only to differ from that in degree; in which, as it is much more favourable and mild with us in general, than it was in the countries where they practised, we have greatly the advantage.

OF THE SORE THROAT ATTENDED WITH ULCERS: AS IT HAS APPEARED IN THIS CITY AND PARTS ADJACENT.

According to the information I have received from several eminent persons of the faculty, it was in the year 1739, that a disease was first taken notice of, which was thought to be the Morbus strangulatorious, already described, and which differed in no essential circumstance, as far as I can learn, from the distemper which is the subject of this treatise.

The sudden death of two children in a family of distinction, and of some others near the same part of town, whose complaints had chiefly been of a sore throat, seem to have occasioned this suspicion: But as very few cases of the like nature occurred after these, or, if they happened, passed unobserved, little mention was made of it during several years.

It began however to shew itself again in 1742, but not in so general a way as to render it the subject of much public discourse; for tho' such of the faculty, as were in the most extensive practice, met with it now-and-then, in the city especially, it remained unknown to the greatest part of practitioners, till within these two or three years, in which time its appearance hath been more frequent, both in town, and the villages adjacent.

In the winter of 1746, so many children died, and so suddenly, at Bromley near Bow in Middlesex, of a disease that seemed to yield to no remedies or applications, that the inhabitants were greatly alarmed by it; some losing all, and others the greater part of their children, after a few days indisposition. Some others of the neighbouring places were affected at the same time with the like disease; which, from all the accounts I have met with, from those who attended the sick, was that here treated of. I am informed likewise that it raged at Greenwich about the same time."

It still continues in this city, and sometimes shews itself in the villages about it, though at present with so mild an aspect, as seldom to prove fatal; unless the subject is very unfavourable, or the disease hath been neglected, or improperly treated at the beginning; which circumstances, tho' of some importance in all cases, yet are the utmost in this; as a wrong step at the first may put it out of the power of art to afford relief.

Tho' this disease has now been amongst us several years, and has consequently survived the different seasons, and all the variety of weather to which we are exposed, yet it seems to shew itself most frequently in autumn and the beginning of winter; at least I have met with many more cases from September to December inclusive, than in all the other months together.

It may likewise be remarked, that the summer of 1747 and 1748 was dry, with some days in each uncommonly hot, for this climate; the mercury in Fahrenheit's thermometer

rising in the shade, and within-doors, one day to 78, and during several to 75 and 6. The autumns of the same years were as unusually temperate and warm; the wind continuing longer in the southerly points than has often been known at this season.

In this country, as well as in those where the Angina maligna was first taken notice of, children and young people are more exposed to it than adults: a greater number of girls have it than boys; more women than men; and the infirm of either sex are more liable to have the disease, and to suffer from it, than the healthy and vigorous. I have seen very few grown people of this class who had it, and not one who died of it.

If it breaks out in a family, all the children are commonly affected with it, if the healthy are not kept apart from the sick; and such adults as are frequently with them, and receive their breath near at hand, often undergo the same disease.

It generally comes on with such a giddiness of the head, as often precedes fainting, and a chillness or shivering like that of an ague-fit: This is soon followed by great heat; and these interchangeably succeed each other during some hours, till at length the heat becomes constant and intense. The patient then complains of an acute pain in the head, of heat and soreness, rather than pain, in the throat, stiffness of the neck, commonly of great sickness, with vomiting, purging, or both.58 The face soon after looks red and swelled, the eyes inflamed and water, as in the measles; with restlessness, anxiety, and faintness.

This disease frequently seizes the patient in the fore part of the day: As night approaches, the heat and restlessness increase, till towards morning; when, after a short disturbed slumber (the only repose they often have during several nights), a sweat breaks out; which mitigates the heat and restlessness, and gives the disease sometimes the appearance of an intermittent.

If the mouth and throat be examined soon after the first attack, the uvula and tonsils appear swelled; and these parts, together with the velum pendulum palati, the cheeks on each side near the entrance into the fauces, and as much of them and the pharynx behind as can be seen, appear of a florid red colour. This colour is commonly most observable on the posterior edge of the palate, in the angles above the tonsils, and upon the tonsils themselves. Instead of this redness, a broad spot or patch, of an irregular figure, and of a pale white colour, is sometimes to be seen, surrounded with a florid red; which whiteness commonly appears like that of the gums immediately after having been pressed with the finger, or as if matter ready to be discharged was contained underneath.

Generally on the second day of the disease, the face, neck, breast, and hands to the finger ends, are become of a deep erysipelatous colour, with a sensible tumefaction; the fingers are frequently tinged in so remarkable a manner, that, from seeing them only, it has not been difficult to guess at the disease.

A great number of small pimples, of a colour distinguishably more intense than that which surrounds them, appear on the arms, and other parts. They are larger, and more prominent in those subjects, and in those parts of the same subject, where the redness is least intense; which is generally on the arms, the breast, and lower extremities.

As the skin acquires this colour, the sickness commonly goes off, the vomiting and purging cease of themselves, and rarely continue after the first day.

The appearance in the fauces continues to be the same; except that the white places become of a more opake white; and it is now discoverable, that what at first might have been taken for the superficial covering of a suppurated tumor, is really a slough, concealing an ulcer of the same dimensions.

All the parts of the fauces above-mentioned are liable to these ulcerations; but they generally are first discernible in the angles above the tonsils, or on the tonsils themselves; though they are often to be seen in the arch formed by the uvula, and one of the tonsils; also on the pharynx behind, on the inside of the cheeks, and the base of the tongue, which they cover in the manner of a thick fur. Instead of these sloughs, where the disorder is mild, a superficial ulcer, of an irregular figure, appears in one or more of these parts, scarce to be distinguished from the sound, but by the inequality of surface they occasion.

The parotid glands on each side commonly swell, grow hard, and are painful to the touch; if the disease is violent, the neck and throat are surrounded with a large oedematous tumor, sometimes extending itself to the breast; which, by straitening the fauces, increases the danger.

Towards night, the heat and restlessness increase, and a delirium frequently comes on. This symptom, which appears in some even on the first night, seems to differ considerably from the like affection in other diseases. They commonly answer the questions put to them properly, but with an unusual quickness; they talk to themselves incoherently when left alone, and frequently betray the first tendency to this disorder, by affecting too great a composure: This for the most part happens to those who sleep but little: for some are comatous and stupid, and take little notice of anything that passes.

In this manner they continue during two, three, or more days; they commonly grow hot and restless towards evening: Which symptoms and the delirium increase as night comes on; a sweat more or less profuse breaks out towards morning; and from this time they are easier during some hours; a faintness only continuing, of which they frequently complain more than of the rest of their sufferings.

The disease seems to have no stated period which can properly be called its or Height. Some grow easier than the first day of the attack; but, in general, the symptoms of recovery appear on the third, fourth, or fifth day, and proceed in the following manner:

> First, the redness of the skin disappears; the heat grows less; the pulse, which was hitherto very quick, becomes slower; the external swellings of the neck subside;[81] the sloughs in the fauces cast off; the ulcerations fill up; the patient sleeps without confusion, is composed when awake, and his appetite begins to return towards more solid nourishment, than has hitherto been allowed him.

The pulse, during the whole course of this disease, is generally very quick; frequently 120 strokes or more in a minute: In some it is hard and small; in others soft and full;

but without that strength and firmness which usually accompany equal quickness and heat in genuine inflammatory disorders.

If a vein is opened soon after the distemper is come on, the blood generally appears of a fresh florid red; the Crassamentum is rather of a lax gelatinous texture, than dense or compact; the serum yellow, and in a large proportion.

The urine is at first crude, and of a pale whey-colour: As the disease advances, it turns yellower, as if bile was diluted in it; and soon after the patient shews any marks of recovery, it commonly grows turbid, and deposits a farinaceous sediment.

They seldom have any stools, if the symptoms are favourable, from the time when the purging, which generally attends the accession, ceases. This discharge is frequently bilious, and without any pain: Tho᾽ these evacuations differ in different habits.

They complain of thirst commonly less in this than in other acute diseases. The tongue is generally moist, and not often furred: In some nevertheless it is covered with a thick white coat or fur, and those who are so affected, often complain of soreness about the root of the tongue.

The uvula and tonsils, tho᾽ they are sometimes so much swelled, as to leave but a very narrow entrance into the gullet, and this entrance frequently surrounded with ulcers or sloughs; yet the patients often swallow with less difficulty and pain than might be expected under such circumstances.63

They frequently complain, soon after they are taken ill, of an offensive putrid smell, affecting their throats and nostrils, which oft occasions sickness before any ulcerations appear.

In those who have this disease in a severe manner, the inside of the nostrils, as high up as can be seen, frequently appears of a deep red, or almost livid colour: After a day or two, a thin corrosive sanies, or with it a white putrid matter of a thicker consistence, flows from them, which is so acrid, as to excoriate the part it lies upon any considerable time. This is almost observable in children, or in young and very tender subjects, whose lips likewise are frequently of the colour above-mentioned, and covered on the inside with vesicles containing a thin ichor, which excoriates the angles of their mouths, and the cheeks where it touches them.

It is probable, that part of the same acrid matter passes with the nourishment into the stomach; especially in children; and it is perhaps owing to this cause in part, that they suffer much more from this distemper than adults; this corrosive fluid without doubt producing the same effects on the stomach and bowels, as it does when applied to the much less sensible skin of the face; i.e. it excoriates the parts it touches; which in fact seems to be the case: For, if they get over the disease, a purging sometimes succeeds it, attended with the symptoms of ulcerations in the bowels; and after enduring great pain and misery, perhaps some weeks, they at length die emaciated: I have been informed, that some children have had the parts about the anus excoriated; the sanies retaining its virulency thro᾽ the whole tract of the intestines.

The sick sometimes bleed at the nose towards the beginning of the disease; and the menses very often appear in those of the female sex, who are of age to have them, soon

after they are seized, notwithstanding the regular period is at a considerable distance: If they are taken ill about the usual season, the discharge is commonly greater than it ought to be. Some young persons, who never had the least appearance of them, have had this evacuation during their illness.

In strong and full habits, these evacuations are seldom attended with much benefit, or manifest ill effects, unless they are very copious; for in this case they occasion great faintness, and an increase of the other symptoms, in proportion to the excess. In tender weak subjects they are often prejudicial.

It has happened in this disease, that hemorrhages from the nose and mouth have suddenly carried off the patient. I have heard of the like accident from bleeding at the ear: But these fatal discharges most commonly happen after the patient has been ill several days; and it seems more probable, that they proceed from the separation of some slough from the branch of an artery, rather than from a fullness of the vessels, or an effort of nature to relieve herself by a salutary crisis.

Bleeding in this disease has in general been observed to be prejudicial: Some indeed admit of it at the first attack, without any sensible inconvenience; but a repetition of it, even where the disease is mild and favourable, seldom fails to aggravate the symptoms; and in some cases it appears to have produced very fatal consequences. The heat, restlessness, delirium, and difficulty of breathing, which this evacuation commonly prevents or mitigates in other cases, in this are increased by it; nor does the swelling of the tonsils, fauces, &c. seem to receive the least benefit from it: On the contrary, tho' the fulness of these parts decreases, yet the sloughs thicken, and change to a livid or black colour, the external tumor grows large, and the spitting commonly diminishes.

Nor has purging been observed to be more beneficial: Gentle cathartics have brought on very dangerous symptoms. Upon procuring a few stools with manna, especially when the disease has continued two or three days, the redness of the skin has disappeared, and the flux to the throat has been surprisingly increased: If it happens that this discharge by stool continues, the swelling of the neck commonly grows larger, the fauces become flaccid, dry, and livid; and the patient in a few hours after this expires: So that purgatives seem to have no better effects in diminishing the tumor, and abating the supposed inflammation, than bleeding.

Nitrous cooling medicines frequently produce the like effects; they increase the faintness which accompanies this disease, and either dispose the patient to copious sinking sweats, or to stools.

Upon the whole, it appears, that all evacuations which tend to lessen the natural strength of the constitution, are in this disease injurious; and that those persons in common are in the greatest danger, if attacked with it, who have been previously indisposed, or have had their strength impaired by grief, or any other accident. Of which it may not perhaps be improper to relate an instance or two in this place, as it will also tend to explain the usual progress of the symptoms in the worst cases we meet with.

A young gentlewoman about 26 years of age, of a pale lax habit, but of an active chearful disposition, had enjoyed a pretty good share of health in common, till a year or two before her last illness; about that time she unhappily made use of some external and empirical application to remove a redness attended with pimples, which now-andthen broke out in her face. She was soon relieved from this complaint by the medicine she used; but was quickly after seized with sickness, vomiting, loss of appetite, and either an obstinate costiveness, or a troublesome diarrhoea; the menses were pale, and in small quantities; and her health in general was greatly impaired.

She had scarce recovered from this weak state, when the death of a near relation brought her almost into the same circumstances; from which she was slowly recruiting, when she married. Her sickness, vomiting, and loss of appetite, soon returned; which she concealed as much as possible.

Under these disadvantages, she was seized with this distemper, a day or two after she had visited an acquaintance labouring under the same disorder: It came on with a coldness and trembling like that of an ague-fit, great faintness, and an acute pain in her head, with a vomiting more violent than she was usually affected with, and a purging. Towards evening she grew very hot and restless, complained of a soreness in her throat, and the discharges abated. Her face, neck, and hands were intensely red; she frequently sighed, and from her aspect and gestures there was reason to suspect a delirium approaching. She slept little that night; and next morning her pulse, which before was very quick and small, seemed to be somewhat more full, but not sensibly slower; and she complained of faintness and anxiety. The parts about the fauces were much relaxed, very red, in some places almost livid, with a kind of glossy dryness upon them. She continued in this manner, without any remarkable increase of symptoms till night, when the looseness returned, and in a very short time exhausted her strength to a great degree: The redness upon the skin disappeared, the extremities grew cold, her eyes became dim, her pulse scarce perceptible, she breathed with difficulty, and expired in the morning, on the third day of the disease.

Another young woman, who frequently visited, and sometimes assisted a relation, who had this disease, was attacked with it in the usual manner. She was about 17, of a pale and somewhat bloated lax habit, naturally inactive, averse to exercise, and was thought to have indulged some painful solicitude, to the prejudice of her health, and making way for an obstinate chlorosis.

Under these circumstances she was seized with the usual complaints, but in a violent manner. The purging continued till the day following; when it yielded for the present to opiates; but constantly returned when their effects were over. The other symptoms, such as heat, restlessness, anxiety, and faintness, increased with the purging; the pulse was small, quick, and hard; a difficulty of breathing came on, the small remains of lustre in the eye perished, and she died early on the fourth day of the distemper.

No marks of any sloughs in the throat appeared in either of these cases; but the redness became daily more intense, and approached nearer to lividness, whilst the

fauces could be inspected; which, from the great difficulty they had in breathing, was impracticable several hours before the patients expired.

Warm aromatic cordials, and anodyne astringents, were administered assiduously, with suitable nourishment, and vesicatories applied successively to the neck on each side, the shoulders and arms, but without effect.

If the purging therefore continues long after the first exacerbation of the disease, it may be looked upon as a dangerous symptom; for tho' it be sometimes restrained for the present by opiates or astringents, yet it commonly returns with more vehemence, when their efficacy ceases, and in a short time exhausts the small degree of strength remaining.

In this case they generaly spit *very* little; the fauces appear dry, glossy, and livid; the external tumor grows large; they void their excrements without perceiving it, and fall into profuse sweats; respiration becomes difficult and laborious; the pulse sinks; the extreme parts grow cold, and death in a few hours closes the scene; and in no disease that I have seen is the eye so early deprived of its lustre as in this; for it is sometimes opake or dim several hours before death; and, as Aetius Cletus hath observed, is a fatal presage of its approach.

A copious flux of pituitous matter to the glands, and other parts about the fauces, seemed to be the cause of sudden death, in a girl about 12 years old. She was seized in the common way, with shivering, headache, sickness, vomiting, and purging. The discharges abated in a few hours, and were succeeded by great heat, redness of the skin, and a sore throat; the uvula, tonsils, and contiguous parts were red, and so swelled in eight or ten hours, as to touch each other, and seemed to close the entrance into the pharynx. She breathed without much difficulty, swallowed with less pain than could be imagined, and spit up large quantities of phlegm. About six in the evening she was seized with a difficulty of breathing, as if strangled: Those about her raised her up, thinking she was in a fit; she recovered herself a little, but expired upon being again laid down in bed, in somewhat less than 24 hours from the first attack. A large quantity of viscid phlegm, with which, after she was dead, her mouth appeared to be filled, together with the tumefied uvula, tonsils, and velum palati, had perhaps jointly closed the Rima Glottidis, and put a stop to respiration.

By a fall in her infancy she was reduced to the necessity of using crutches. She was big-boned, had a good appetite, and for want of that exercise, which persons at her age commonly enjoy, seemed to be plethoric. These circumstances perhaps might contribute to this speedy and unhappy event.

Accidents of the like kind seem not to have been uncommon while this disease continued in Italy, according to a remark of Cortesius.

From the preceding account of the sore throat attended with ulcers, it will, I believe, appear, that this disease is widely different from a common sore throat, or simple inflammation of any of the parts about the fauces; both as to the subject commonly affected by it, the manner of its attack, the progress of the symptoms, and its conclusion: For the sore throat with ulcers generally attacks children; and of these,

girls more frequently than boys, as hath been observed: If adults are seized with it, they are commonly such as have been very much conversant with the sick, or else are weak and infirm: And it seems to affect those adults in the severest manner, who have been previously indisposed, or whose strength has been reduced by unseasonable or immoderate evacuations.

On the contrary, the common angina, or an inflammation of the tonsils, most frequently attacks the healthy, the vigorous, and robust; the weak, the delicate, and infirm, are less exposed to it, at least suffer less from it, than the former.

As both diseases are attended with a fever, and as most fevers come on with a shivering or chillness, this symptom may at least appear equivocal: But if sickness, or vomiting, or purging, or an acute headache, towards the back parts or top especially, or if all these, come on in the space of a very few hours, which they generally do, where the disease is vehement, it may justly be esteemed to be of the putrefactive kind: But if with these symptoms an erysipelatous redness discovers itself in the fauces, with ulcerations or sloughs, the disease is evident.

In some cases, the symptoms have been so obscure, that it was difficult to determine to which disease they properly belonged: But in these circumstances they were commonly so favourable, that, supposing the disorder not to be of the ulcerated kind, no other inconvenience seemed likely to ensue from treating it as such, than a suppuration: which is often an event rather to be chosen than avoided.

The redness of the skin in the face, neck, breast, and hands, is another obvious and distinguishing characteristic, which in children and young people especially, seldom fails to accompany this disorder.

In the common sore throat, a local inflammation is the disease: All the symptoms are derived from this source: An acute throbbing pain, greatly increased upon swallowing even liquids, is the principal grievance. In the other, the whole habit suffers, as if by a stimulus of a peculiar nature; and although the throat is always more or less affected, yet it is sometimes the least part of the patient's complaint; and instances have occurred to me of considerable sloughs being formed, before any soreness or pain in the fauces hath been mentioned.

Again, this disease is accompanied with a greater tendency to a delirium, than either a common angina, or almost any other disease we are acquainted with. To have this symptom appear in the disease we are treating of on the first night, is not uncommon; and on the second, frequent. A girl about eight years of age, whom I attended, was scarce known to be indisposed, till she alarmed the family, by appearing to be light-headed. She had made no complaint of her throat, nor was this part thought to be affected, till, upon examination, I found it so; being led to suspect it by the colour of her hands, and the delirium. She got well through the disease, tho' its progress, at first, appeared to be very swift.

A common sore throat, if the patient recovers, either goes off by resolution, or the parts affected suppurate, or, if glandular, become hard and scirrhous.

In that attended with ulcers, none of these circumstances happen; for it terminates in a superficial ulceration of some of the parts about the fauces, with little appearance

of any sloughs, if the disease is very mild; and with large and deep ones, of a white, cineritious, livid, or black colour, if it is more violent.

It will not perhaps be difficult, from this comparative view, to distinguish this disease from a common sore throat, or an inflammatory affection of those parts: But there is another no less certain criterion, tho' too often a fatal one, which is, the constant increase of symptoms upon bleeding, purging, and the liberal use of cooling antiphlogistic medicines: A method, which as seldom fails removing a genuine inflammation, if it is early enough and assiduously pursued, as it is too often injurious in the present case. An instance whereof I think evidently appeared in the following case.

A youth of about 14 years old, of a brisk lively disposition, who had enjoyed a good share of health, saving that, for a few years past, a cutaneous disease, akin to a leprosy, had sometimes appeared on his head and arms, was seized one morning with a general uneasiness, and a disposition to vomit; he was put to bed, and a severe shivering ensued; his sickness increased, he vomited up everything, had sever-al purging stools that day, and complained much of his head, with some soreness in his throat. He was ordered to be blooded, and had an emetic given him: This operated but little; he grew hot and restless, a deep redness spread itself over his face, hands, and arms, with a plentiful eruption of small pimples, which induced those about him to apprehend it was a common scarlet fever.

The next day, which was the second of the disease, his throat continuing sore, and the feverish symptoms increasing, a purge of manna was given him, which operated gently; and at night his head and throat being more uneasy, his heat still continuing, with a tendency to delirium; a blister was applied.

On the third day, the symptoms not abating, he lost about ten ounces of blood. He had taken a cooling nitrous powder every four hours; this was now changed for one more cordial. At night he grew delirious, his fever increased, and he had some loose stools, which were rather encouraged than restrained, as it was hoped they might relieve him. Blisters were applied to his head and arms.

On the fourth in the morning I was sent for: I found him delirious, with convulsive twitchings; his hands in constant motion, gathering the bed-cloaths; his pulse quick and weak; his tongue parched. With some difficulty I looked into the fauces; *they* seemed to be pale in some places, intensely red or livid in others, with a glossy brightness: His excrements came away involuntarily; his eyes were languid, and dim; he breathed with difficulty, fell into profuse clammy sweats, and died in a few hours after.

In some of the first cases I met with, the quickness of the pulse, the degree of heat, the apparent inflammatory redness of the eyes and face, and pain in the head, sometimes urged me to order bleeding, especially if there were any marks of a plethora; but in these cases it did not appear to have any advantageous effects: So that, notwithstanding the urgency of the symptoms above mentioned, it seems proper in general to omit this evacuation.

Cupping with scarification has been applied to the shoulders and back of the head, in order to remove an acute pain of this part, which is often complained of, but, as far as I have been able to observe, without much benefit.

It is necessary that the patient should keep in bed as much as may be, tho' the disease should seem to be slight: It has happened, for want of care in this respect, that a purging has come on, the redness of the skin disappeared, and a disorder, which with confinement alone would probably have gone off in twice 24 hours, had been rendered tedious and difficult.

If we are called in at the first, while the sickness or vomiting continues, it will be of use to promote this discharge, by giving an infusion of green tea, chamomile-flowers, carduus, or a few grains of ipecacuanha. In some instances, where the attack has been severe, and this method practised, the disorder has gone off with more ease than was at first apprehended.

If these symptoms don't abate with the operation of the emetic, small draughts of mint-tea, with a sixth part of red port added to it, may be given frequently; together with some grateful and warm aromatic, cordial medicine, every four to six hours. The Pulvis Contrayervae simp.-comp. Confect. cardiac., Raleigh. Spec. arom. Vinum croceum; Aq. Menth. spirit. cum aceto;[70] with others of the like nature, may be used for this purpose.

In this disease it is at all times necessary to attend very carefully to the diarrhoea. For the most part it ceases with the vomiting, in less than twelve hours from the first attack: If it continues longer than this period, it is necessary to check it, otherwise it occasions great faintness, sinks the strength, and in the end produces very dangerous consequences. The aromatic cordials above mentioned, if they are given plentifully, commonly take off this symptom, as well as the vomiting; but if they prove ineffectual, recourse must be had to astringents and anodynes, in proportion to the exigence of the case; such as the Confectio Fracastorii, or Elect. e Scordio, dissolved in small cinnamon-water, and given post singulas sedes.

It is common for the redness, so often mentioned, to appear upon the skin, as these discharges abate: It has happened that this colour has gone off sometimes, and the patient has been brought into imminent danger, upon giving a mild cathartic: Which circumstances, as they point out a close connexion between them, indicate the use of a warm regimen, notwithstanding the heat and other symptoms might seem to forbid it.

A girl about 9 years old, of a slender make, but healthy and active, was seized with this disorder. The sickness and vomiting went off, and the redness of the skin appeared soon after: The apothecary who attended her, judging it an inflammatory case, as she complained of her throat, bled her, gave her a cooling purge the next day, and afterwards some nitrous draughts. A plentiful efflorescence which covered the face, neck, and arms, suddenly disappeared; a diarrhea came on, she grew restless, faint and insensible. In this condition I first saw her on the third day of the disease; she frequently sighed, her pulse was quick, small and hard, without any remarkable colour upon her skin; and the swelling on each side of the neck large: It was not possible to examine the fauces, as she lay in a comatous helpless condition, her stools and urine coming away insensibly. A warm cordial mixture" was frequently given her, upon which the diarrhoea soon abated; and the next day the efflorescence again appeared upon her face and arms.

From this time she continued to recover, tho' slowly, and was for some time attended with a cough and hectic heats.

Another symptom, which requires our attention in the cure of this disease, is an excessive faintness: Of this they generally complain soon after they are taken ill, and continue to do so, if sensible, till the distemper begins to abate: The urgency of this symptom seems to indicate the degree of danger: It is more or less violent, as the disease is mild or malignant; and an abatement of it may be looked upon as a sure presage of recovery.

Warm aromatic and gently stimulating medicines, such as have been already mentioned, as the most effectual to suppress the vomiting, and check the looseness attending this disease, have likewise been found useful in removing the present complaint: And tho' the degree of heat, and quickness of the pulse, would be enough to dissuade a person who has not seen the disease, from giving them in so liberal a manner as necessity requires: yet we are not to be governed so much by these symptoms, as by the faintness, despression of the pulse, and increase of putrescency in the fauces. One drachm of the Confectio Raleighana has been given to a youth not quite 15 years of age, every four hours, which was soon followed by a sensible amendment, and the decrease of the patient's restlessness, faintness, and heat.

Some of the Italian physicians forbad the use of wine in the cure of this disease, and the warmth of that climate might perhaps make this caution necessary; but as it is a generous cordial, and at the same time antiseptic, it seems to be in no respect improper here; and, besides in whey, I have allowed it to be given, in small quantities, mixed with mint, baum, or sage-tea, barley water, gruel, panada, sago, and the like; and alone, where the faintness has been excessive; the age, the former way of life, and the symptoms, affording the necessary rules as to quantity and kind. Chicken-water, or thin broth, may also be allowed, which is frequently very acceptable to the patient. And I don't remember to have observed so general and early an inclination after solid food, in any acute disease, as in this: For at a time when one would imagine, both from the condition of the fauces, and the degree of heat, that liquids would be the most acceptable, it is not uncommon to find children, who have this disease, extremely desirous of chicken, and chearfully complying with directions, in hopes of being gratified in this respect.

Blisters are likewise of use to relieve the faintness. At first I was in doubt, lest the flies, by their acrimony, should increase the putrescent disposition, and consequently aggravate the disorder they were intended to remove: But no such effect having appeared from their use, I have ordered them to be applied, and I think with advantage, both to the usual parts, and to the neck on each side from below the ear almost to the clavicle, as occasion required.

The ulcers in the throat demand our early and constant attention, as a considerable loss of substance cannot here be suffered without immediate danger to life itself, or the most injurious consequences to the future action of the parts, if the patient survives.

Where the disease is of the mildest kind, a superficial ulceration only is observable; which may easily escape the notice of a person unacquainted with it. A thin, pale, white

slough seems to accompany the next degree: A thick, opake, or ash coloured one is a further advance: And if the parts have a livid or black aspect, the case is still worse. These sloughs are not formed of any foreign matter spread upon the parts affected as a crust or coat, but are real mortifications of the substance; since whenever they come off, or are separated from the parts they cover, they leave an ulcer of a greater or less depth, as the sloughs were superficial or penetrating.

When the tendency to putrefaction is stopped, these sloughs in most cases come off spontaneously; or their separation may be promoted by suitable remedies and applications: But it seems by no means adviseable to attempt it by force, or to scrape them off with the fingers or instruments, as Severinus proposes; since the experiment has been tried, but with such unhappy consequences", as are sufficient to discourage one from persisting in this method.

In a case where I was concerned, previous to my being called in, a surgeon had endeavored to separate the sloughs by the assistance of his probe: He succeeded in his attempt without much difficulty; but was surprised to see the same parts covered the next day with thick, dark, ash-coloured sloughs, penetrating deep into the sub-stance.

It is true, the sloughs have been sometimes scarified, from an apprehension, that matter was lodged underneath them, without any manifest inconvenience; but as there are many instances of fatal mortifications having ensued, it seems most prudent to decline the practice.

From under these sloughs, and from every part of the ulcers which they cover, a thin corrosive ichor is discharged, so acrid as to excoriate the external parts upon which it is suffered to remain. This is sometimes observable in adults, when the parts above the fauces are affected; the ichor in these cases flows thro' the nostrils, and frequently raises pimples and small blisters on the skin of the upper lip, but it is most obvious in children, who often have this part, the corners of the mouth, the cheek of that side on which they most commonly lie, blistered or excoriated.

It is probable, as has been already hinted, that part of the same virulent matter, passing down the oesophagus into the stomach and intestines, acts upon them as it does upon the skin, when applied to it externally; it frets and corrodes the parts it touches, and produces that sickness, vomiting, purging, and faintness, which sometimes accompany this disease in different parts of its progress.

In children, and very young subjects, the symptoms arising from this cause are yet more dangerous: The natural softness and laxity of the parts liable to be affected, disposes them to suffer by it much more than adults: At the same time they are commonly alike incapable of promoting the discharge of this matter themselves, and of admitting assistance from others, being generally, if the distemper is not very mild, either comatous and stupid, or delirious and untractable. If gargles are injected, they either prevent them from reaching the seat of the disorder, by their tongues, or they swallow them, and the putrid taint of the ulcers, together; the mischief spreads beyond the power of art to restrain it; violent purgings ensue, or fatal hemorrhages from the penetrating gangrene.

And to this, perhaps, it may in part be owing, that children suffer so much more from this kind of sore throat, than adults.

That this corrosive matter produces these effects, is farther con-firmed, by observing, that those whose throats are severely affected, if they have a plentiful discharge from the fauces, are seldom attended with sickness, vomiting, or excessive faintness; tho' after longer sleeps than ordinary, or a neglect of encouraging this evacuation, they have complained of sickness, and have had reachings come on: Likewise, that in such cases, where little or no discharge of this kind appears, the symptoms are commonly the most dangerous.

From hence it is obvious, that great advantages may be expected from the constant use of gently stimulating aromatic gargles; as they promote the discharge of the pituitous matter flowing to the fauces, and, doubtless, with it, of some parts of the corrosive fluid above mentioned: To which if we add antiseptics and detergents, in order to check the progress of the mortification, and cleanse the sordid ulcers it produces, every indication is provided for.

Where the disease is mild, the symptoms favourable, the sloughs superficial, or scarce perceptible, it may be sufficient to order a gargle of sage-tea with a few rose-leaves added to the infusion; three or four spoonfuls of vinegar may be mixed with half a pint of the tea, and as much honey put to it, as will leave it agreeably acid.

But where the symptoms are urgent, the tendency to putrefaction great, the sloughs large and thick, and the breath offensive, recourse must be had to more efficacious remedies: A composition like the following, varied only as the patient's age and the circumstances of the disease required, has in general been attended with very good effects. The proportions here given may be used for adults, and the more active parts lessened for younger subjects.

Rx Decoct. Pectoral.	adj. cui inter coquendum add.	Bad. Contayerv.
contus. fs. Liquori colato admisce Acet. Vin. Alb.		ij. Tinct. Myr.
i. Mel. opt.	vi. f. Gargarisma.	

As the parts about the gullet are frequently so much affected, as to render it painful or impracticable for the sick themselves to make use of the gargle so freely as they ought, it is commonly ordered, that a few spoonfuls of this liquor, made somewhat warm, should be very often injected into the fauces with a small syringe; and especially before the patient swallows any thing, in order to wash off as much as possible the putrid sordes adhering to the ulcers, and prevent it from passing into the stomach and bowels." In young subjects this method is the more necessary, as they don't always know how to manage a gargle to any purpose, did the soreness of the parts permit them to do it."

As so much depends upon the frequent use of gargles, or rather of injections, a strict attention to this affair, can scarcely be too strongly enjoined to those who have the care of the sick committed to them; since an assiduous repetition of these lotions not only promotes a discharge from the glands of the throat, which is probably of great use", but retards the progress of the ulcers, by washing off the putrefactive corroding

virus, and prevents a large train of very dangerous symptoms; and has therefore been strenuously insisted on by several writers, by Mercatus especially.'

If the sloughs are large, and cast off slowly, they may be touched with Mel Aegyptiacum, by means of an armed probe; or if the condition of the fauces is such, that this cannot conveniently be done, a spoonful of the following mixture may be injected, and retained in the throat, as long as the patient can endure it; the parts may then be washed two or three times with the gargle alone.

Rx Gargarism. praescript. ii. Mel Aegypt.

By the constant and regular use of these applications, if the patient is kept warm, and the method of treating him in other respects is observed, agreeable to what has been mentioned above, it seldom happens but that the febrile symptoms disappear, the sloughs come off, and the ulcers are disposed to heal in a few days; unless it be where mismanagement at first, malignity of the infection, or an unfavourable constitution, have one or all contributed to increase the disease, and to render its consequences more lasting and mischievous.

What effects improper treatment produces in this case has already been observed. With regard to the matter of contagion, or the nature of that cause which so suddenly brings on such a train of symptoms as hath been described, little can be said with any degree of certainty: Thus much, however, seems to be true in fact, that in some cases this disease appears to be of so mild a nature, and so benign, as to require but little assistance from art: Persons even recover from it under the disadvantages of unskilful and injurious management; whilst in others, the progress of the symptoms is so rapid, and the tendency to corruption so strong, that nothing seems able to oppose it. Just as it happens in the small-pox; the benign and distinct sort bears ill treatment without injury; in the malignant flux kind, the utmost art and experience are too often insufficient to conduct the distemper to a happy issue. Whether this diversity in the sore throat we are speaking of, is owing to a difference of constitutions, or of seasons, to the different quality or quantity of the contagion, or the manner of receiving it; or whether there are in reality distinct species of it; may perhaps hereafter be more certainly determined.

With respect to constitution, it may be further observed, that in soft, lax, leucophlegmatic habits, and languid inactive dispositions, every thing else being equal, the disease seems to proceed more slowly, to go off more irregularly, and to leave behind it more lasting effects. In some persons of the temperament described, tho' the fever has grown less, and all the symptoms abated in four or five days, yet the sloughs in the throat have continued almost a week longer; whilst in the opposite constitution, tho' the disease has been much more acute, yet the symptoms have no sooner abated, than the sloughs have cast off, and the ulcers healed, of their own accord.

A copious hemorrhage from the nose, mouth, or ears, the last especially, coming on after the disease has continued three or four days, or longer, is a dangerous phenomenon: For at this time of the distemper, it most probably proceeds from the

branch of an artery destroyed by the mortification, and laid open by the separation of the slough, as hath been already observed. If the vessel is therefore large, the bleeding may prove fatal to the patient in a very short time; or if he escapes for the present, the loss of a considerable quantity of blood at this time of the disease, will occasion various ill consequences.

It is therefore absolutely necessary to endeavour to stop this discharge with all the expedition possible. If the patient is costive, it will be of use to procure relief in this respect, by clysters or suppositories, as soon as can be done: To apply vinegar, by means of tents or otherwise, as near to the orifice of the vessel as we can: To convey the steam of it into the fauces and nostrils plentifully, and to keep the patient in a sitting posture, or his head raised as high as may be, and his upper parts moderately cool: If these methods don't immediately take effect, recourse must be had to more efficacious ones, amongst which we may rank the bark and opium.

It is not uncommon for hectic heats, night-sweats, want of appetite, and dejection of spirits to attend those a considerable time, who have had the disease in a severe manner. Asses milk commonly relieves them, together with a decoction of the bark, and elixir vitrioli.

Having thus related, as concisely as I could, the most material circumstances that have occurred to me in respect to the symptoms, progress, and event of this distemper, the Juvantia, Laedentia, and the accidents chiefly to be regarded in its cure; in such a manner as I hope will enable those who have not seen or known it, to distinguish it from a common sore throat, and to treat it with some degree of propriety and success, I shall conclude with observing.

That the sore throat attended with ulcers seems to be accompanied with a strong disposition to putrefaction, which affects the habit in general, but the fauces, and the parts contiguous, in particular. And it seems not unreasonable to suppose.

That the cause of this tendency is a putrid virus, or miasma sui generis, introducted into the habit by contagion; principally by means of the breath of the person affected.

That this virus, or contagious matter, produces effects more or less pernicious, according to the quantity and nature of the infection, and as the subject is disposed to receive or suffer by it.

That putrefactive and malignant diseases, in common, admit of the most sensible and secure relief, from discharges of the peccant matter, either upon the skin in general or on particular parts of the body.

That the redness, and cutaneous efflorescence, in the present case may be considered as an eruption of the like nature; and therefore to be promoted by such methods as have proved successful in similar diseases.

That a cordial, alexipharmac, warm regimen has been found by experience to be of the most use in such cases; and that bleeding, purging, antiphlogistics, liberally employed, either retard, or wholly prevent these discharges.

Therefore, as to expel the morbific matter seems to be the design of nature, to promote this design by the measures that are approved by experience in analogous disorders, is the duty of the physician.

NOTES

Ab Hispanis Garrotillo appellatur, ut eadem patiantur Angina laborantes, quae facinorosi homines, cum injecto circa collum fune strangulantur. Epist. R. Moreau ad Th. Barth. Epist. Med. Cent. i. p. 336.

Affectus suffocatorius, Carbunculus angionosus, Phlegmone anginosa, Angina pestilentialis, Epidemica Gutturis Lues, Morbus Gulae, Morbus Puerorum, Pestilens ac praefocans pueros abscessus, Tonsillae pestilentes, Aphthae malignae. Passio anginosa, Laqueus Gutturis, &c. Vide Cortes. Miscel. Med. p. 696. Severin. (Sr Epist. Ren. Moreau ad Th. Barthol. de Laryngotomia. Severin. de recondita Abscessuum natur. p. 446.

Joh. Wieri Observat. lib. vi. de Angina pestilenti Epidemica, Oper. p. 910. Pet. Forrest. Observat. lib. vi. de Febribus publice grassantibus, p. m. 150. Bern. Ramazzini Constitutiones Epidem. Oper. p. 195, & seq. Medical essays, vol. iii, p. 26.

Tournefort's Voyage to the Levant, vol. 1. p. 133.

D. Ludovici Mercati, Medici a cubiculo Philippi III. Hispaniarum, Regis, &c. Oper. Tom. 5. Francof. 1614.

De Faucium et Gutturis anginosis et lethalibus Ulceribus. Consultatio xxiv. p. 137.

"De pestilente faucium affectu Neapoli faeviente, opusculum, auctore Jo. Andrea Sgambato, philosopho ac medico Neapolitano, et academico otioso. Neapoli excudebat Tarquinius Longus, 1620, in 4to.

Joannis Baptistae Cortesii, medici ac philosophi, in Messanensi academia praxim ordinariam e prima sede interpretantis, Miscellaneorum Medicinalium Decades Denae. Messanae 1625, in fol.

"Divi Francisci Custos, vir doctrina et moribus insignis, hac lue obsessus, tonsillas solummodo et gargareonem inflammatione laesa habebat, et continuo querebatur se percipere in ore faetorem quendam; et ut hac de re certior redderetur, ad se vocavit baccalaurem quendam sibi amicissimum, qui maximo affectu affistebat, rogavitque ut vellet olfacere, percipereque naribus, an verum effet talem faetorem emittere, an ab ejus imaginatione prodiret: olfecit baccalaureus me (scil. Cortesio) praesente, et multis aliis, at statim non multis elapsis hors decubuit sola faucium et glandularum inflammatione vexatus, absque aliqua manifesta corruptione partium, omnibusque praesidiis ex arte factis, quarto die suffocatus periit; et tamen Custodem non tetigerat, sed solo olfactu aerem ab ore prodeuntem naribus traxerat: quare ab hujusmodi exemplo veni in sententiam hunc morbum non esse absque aliqua contagione. Cort. Miscel. p. 698.

"De morbo strangulatorio, opus Aetii Cleti Signini, doctoris medici et philosophi. Romae 1636. 8vo.

"De recondita abscessuum natura, libri 8. Marci Aurelii Severini Tharsiensis, philosophi et medici, regio in gymnasio Neapolitano anatomes et chirurgiae professoris. Editio secunda, Francofurti ad Maenum 1643. And again printed with Bartholine's Exercitationes, as a Commentary upon it, with Villani's Therapeuta Neapolitanus, seu veni mecum Consulter. Neapoli 1653.

"Thomae Bartholini de Angini Puerorum Campaniae Siciliaeque epidemics exercitationes, Lut. Parisior. 1646.

"Zacutus Lusitanus also mentions this disease, and relates an unhappy instance of its effects in the following terms.

"Quod ad contagium attinet, hoc communi omnium consensu atque experimento evincitur. Severin. p. 442.

Difficultas respirandi, et non raro deglutitiendi, cum pectoris et dorsi dolore ac veluti compressione suffocante, simul cum pestilenti odore, et vehementi harum omnium partium ardore, et rubore totius oris et colli, cum vocis et loquelae vitio, ac linguae extractione, et siti incompescibili. Mercat. Consult. p. 136.

"Maxime ob malignissimam febrem, quam plerumque sibi adjunctam habet, &c. Consult. p. 136.

. . . nec multum, fidere oportet, si febris mox non appareat aut succrescat, nam saepe citius suffocat affectio, quam causa succendatur; ac non raro malignitas humoris corrumpit spiritus et mortem accelerat, sine eo quod febris succendatur. Mercat. Consult. p. 137.

Severin. p. 442.

'Sgambat.

Quibus etima accedit sublimis respiratio et alta ac spirituum revulsio, cum maxima pinnarum nasi distentione, saniei per os et Pares excretio, variis ulcerium coloribus et intensissimo faetore nauseam plerumque movente cum sordida excretione. In aliquibus vero extra, prope cervicem, et infra mentum glandulae apparent, pestiferi morbi naturam redolentes, et universa cervix, et collum intumescunt, et fauces cum rubore saturato, instar laqueo suffocatorum. Mere. Consult. p. 136

Severin. p. 440.

. . . erat quidem dira humoris conditio adeo perniciosa, efficax et contagiosa, quod digitum patris indicem, quo extrahebat eum succum ob ore filii, mordicaret, et in ruborem moveret cum dolore: tandem mox pater conquerebatur de difficultate respirandi et deglutiendi cum dolore et tumore faucium, ac saturato colore, et glandulis extra apparentibus juxta mentum. Ex quibus secundo die halitum prave olentem expirabat; ita ut jure optimo possis colligere, contagio filii partem fuisse affectum. Mercat. Cons. p. 139.

"Hoc unum salutis est indicium vel interitus: dum oculorum nitor adservatur, salutis spes semper adeft; quo tempore hic deperiit, in propinquo mors est. Aetii Cleti Op.

. . . indies magis ac magis haec accidentia crescunt, donec brevissimo tempore laborantium majorem partem perimat idque non raro infra quartum diem. Merc. p. 137.

Aetii Cleti Op. de Morbo Strangulatorio.

Quinimo post xxx dies, et xl. jam praerepti morbi furoribus, praeter omnium opinionem ex improviso sunt extinct. Adeo scil. latitans et recondita veneni vis est. Severin. p. 440.

"Aet. Clet.

Servin.

. . . ut pestis more in citissimam mortem pueros adultos deducat. Merc. Consult. p. 135.

. . . disputare coepimus de sanguine extrahendo: siquidem non defuerunt medici, qui id renuerent: caeterum unamimi consulentium consensu, primo die sanguinem misimus, cruribus scarificatis, et mox octava noctis hora brachiis, aut si ultra duos annos suerit natus, ex vena brachii: in hoc malo plurimum vereri oportet, vires plurimum dejicere. Mercat.

Brevissime secandam esse venam in hoc confitentur omnes. P. Mich. de Heredia de Morb. acut. p. 101.

"Circa quod praesidium (venaesectionem) in pueris exequendum, consulo ne differatur, quia ejus occasio solum est, antequam fluxio in partibus contenta ad putredinem commigret. Nam tune temporis, si sanguinem suderis, summopere laedes, quae causa fuit quod multi medicorum, viso hoc damno renuerint sanguinem mittere. Mercat. Consult. p. 138.

In hoc sacro igne non mittendus est sanguis in ea quantitate ac in angina exquisita., Placuit quibusdam in hoc morbo secare venas sub lingua; alii admoverunt hirudines collo: mihi nulla istarum evacuationum unquam probari potuit. Nam cum tumor superveniens ex sanguine non oritur, frustra adhibentur ea auxilia quae ad sanguinem ex parte affecta evacuandum excogitata fuerunt. Sgambat. de Pest. Faucium Affect.

Esse vero efficiendas parcas missiones in quantitate, dum revellere intendimus, docuit antiquitas., Quod praeceptum magis observandum in morbo praesenti, in quo nimis timemus virium jacturam. Copiosa enim sanguinis missio, praeterquam quod minus proprie revellit, dejicit vires. P. M. de Heredia, ubi supra.

"Severin, ubi supra.

. . . hoc solo praesidio aliquando visum fuit, pueris ad integram sanitatem recuperandam sufficere, sicut aliis sanguine detracto, vires plurimum fuisse dejectas. Merc. Cons. p. 138.

Quod evacuandum morbus exposcit, evacuetur brevissime. Idem, p. 102.

. . . in morbis malignis breviter destruentibus vires, et poscentibus simul robur animalis virtutis ad sui sanationem, multum evacuare non licet. Heredia, p. 102.

Si vero malum non mitescat, set gravius affligat partem, quod constabit ex-jucido aut nigro colore, vel ex nimia mollitudine, cum intolerabili faetore, scarificabitur profunde, prout partis natura tulerit. Heredia. p. 105.

Cort. Miscel. p. 697.

Multi etiam vesicatoria consulunt spatulis applicata, Quod auxilium parum prodesse semper vidi. Heredia, p. 108.

Sgambat.

Heredia, ubi supra.

Febris etiam continua statim in initio apparet, symptomica quidem. Idem, p. 97.

"Hoc unum observantissimum habeo, nimirum omnes oris et gutturis collutiones efficere supra decoctum ejus celeberrimi medicamenti, quod medici Hispanl Contray-erva noncupant, maxime si mucosa et viscida pituita abundaverit. Mercat. Consult. p. 138.

Experimento monstratur, quamcunque evacuationem per alvum, aut sudorem inutilem esse et nocivam, quia cum non profit, necessario debilitat. Hered. p. 100.

Cortes. Miscel. p. 703.

DSgambat. de Affectu Faucium pestilente.

1Heredia, p. 105.

Item ibid.

Celebris utilissimaque est unguenti Aegyptiaci lotura: sumuntur quidem ij. et infunduntur in 3 ij. aquae hordei, plantaginis, vel seri lactis: post infusionem percolatur per linteum, et colatura tangitur ulcus. Idem ibid.

Ego quidem arbitror, plures pueros interfecisse usum horum medicamentorum, quae caustics sunt, quam affectionem ipsam. Mere. Consult. p. 139.

. . . compertum habuimus in hoc viro, et aliis laborantibus, haec caustica inflammatione et ulceri summopere esse nocua: suppurantia corruptioni. Id. p. 40. Heredia, p. 106.

Idem, p. 109.

The reader may be pleased to take notice, that the facts contained in the following narrative, where the contrary is not expressly mentioned, have all come under the author's observation, who has endeavoured to relate what he has seen, and only what he has seen, in such a manner as he thought would best contribute to public advantage. It may also be necessary to observe, that the disease is described, as it appeared in 1747 and 1748, that if the symptoms should hereafter vary in any circumstance, the diversity may be attributed to the nature of the distemper, and not imputed to design or inattention.

The vomiting and purging were but seldom observed to accompany this disease, at its first appearance amongst us, as I have been informed by some physicians of eminence, who saw it early; but it is generally agreed, that these symptoms almost constantly attended, in the manner here described, during the years 1747 and 1748, the time in which these observations were collected: And I have found, that within these three months, the above mentioned symptoms have not so regularly appeared as before.

The redness and eruption have not accompanied this disease so regularly, during the latter part of this winter, as they did in the preceding seasons: In some cases they did not appear at all; in others not till the third or fourth day; and, as I have heard, in some not till the fifth, and even later.

Heredia takes notice of the same symptom, and assigns a very probable reason for it. In Angina maligna non tument externa, quia in illas ex extemis translata material fuerit, sed quia ita adimplentur interns, ut materiam fluentem non capiant, et sic ad externa dilabitur. Heredia, p. 99.

"At least, of all the parts about the neck, except the parotids themselves; which sometimes continue swelled and hard a long time after the other symptoms abate, and at length suppurate.

"But it is often fizy when the disease has continued two or three days; and in some instances which lately occurred, it was so, soon after the first attack.

"I have seen a few cases, where these glands were so enlarged, as to force back thro' the nostrils a considerable part of the nourishment they took.

"Some adults, who have had the disease in a violent degree, have suffered very much from the same cause: Emolliet mucilaginous liquids taken plentifully, and also applied externally, by way of fomentation, to the part affected, frequently give speedy relief.

This I find was also Heredia's opinion, who considers a discharge of blood either from the mouth or nose, as a sign of the utmost Danger., Malignam significationem praebet segnis sanguis stillans e naribus; ex corrosione quippe vasorum, et putrilagine emanat, innuitque certissimam mortem, quia putredo interne cohiberi non potest: ideo periculosissimus consetur sanguinis fluxus ex naribus aut ore. Quidam cum hog signo nullum vidisse liberatum docent: nos vero unicum solum aegrotum summa dilligentia a tanto periculo vindicavimus. Heredia, p. 100.

Tho' of three whom I attended, and who had this symptom, two recovered; the third died of a bleeding at the nose, before any assistance could be procured.

The heat indeed and quickness of the pulse seem at first to be affected by this evacuation, but they commonly return after a fallacious respite with greater violence; the patient is seized with a difficulty of breathing, falls into cold sweats, a stupor, and dies suddenly.

"Heredia's description of this fatal progress of the disease, and the necessary cautions he gives in respect to the prognostic, deserve particular notice.

Fallacissimam esse hujus morbi naturam, consitentur omnes. ulceribus oris, et partium quae visui existebant conspicuae, recte curatis, et sedata inflammatione aeger periclitatur. ex eo quod paulatim serpit putedo per asperam arteriam ad cor, aut per gulam ad ventriculum, sine aliquo dolore, aut febre sensibili, cujus sit habenda cura: et cum medicis auxiliis, ablata fuerint ulcera, et inflammations sedatae in partibus vifui patentibus, occulta putredo, paulatim mortificans partes internas, tabe, parvissimis et debilissimis pulsibus extinction caloris, refrigeration extremorum faciei extenuation, inappetentia, perpetua, et molests mutation decubitus, somno fallaci, et apparente, quia vigilandi impotentia, somnum verum aemulatur, misere aegrotantes interficit, ut visum jam sit subita et inopinata morte periisse aliquos, e lecto surgentes, et intra domos ambulantes; ob quod etsi quae vitiata apparebant in faucibus, aut partibus aliis, in melius mutata conspiciantur, non licet salutem polliceri, quia solet communicari paulatim putredo, et gangraena partibus intemis. Heredia, p. 99.

. . . Ad praedictarum partium (uvulae, tonsillarum) inflammationem subsequebatur interdum materia quaedam pituitosa a capite tam repente et inopinato descendens, ut miseri aegrotantes subito suffocarentur. Cortes. Miscell. p. 697.

The disease here treated of is, strictly, a sore throat; since by soreness we aptly express the uneasy sensation accompanying an ulcer (i.e. a sore) and not that which attends an inflammation; which is indeed pain, but not properly soreness.

"Vegetable acids, such as the juice of lemons, oranges, wood-sorrel, verjuice, vinegar in small doses, and the like, as they are undoubtedly antiputrescents, may seem to be indicated; but their proneness to increase the discharge by stool, or profuse sweats, ought to render us very circumspect in using them.

Rx Aq. alexet. simp. vj. Alexet. Spri. cum. Acet. jfs. Con. cardiac. 3 jfs. Pulv.

Contray. simp. 3 fs. Syr. Croc. ss. f. Mixt. de quacapiataegracoch. ij. tertiaquaque hors.

It has been observed by several, that the discharge from blisters in this disease, is in general both more copious at first, and continues longer than is usual in other cases.

quis tamen vel digitis, vel aliquo instrumento levi ipsam (materiam albam) auferre tentasset, quamvis operatio haec *Beret* absque dolore, ea tamen ablata brevissimo tempore peribant

aegrotantes; quod prae caeteris in Petro Soprano genero meo observatum est, cui cum hujusmodi mortificatio apparuisset in suprema superficie dictarum glandularum faucium, et palati, ita ut videretur ease maximo respirationi et deglutitioni impedimento, chirurgus existimans posse facillimo negotio a subjectis partibus eam separari solis digitis, levissime quidem earn abstulit; quae ablata, tantum abest ut juverit deglutitionem aut respirationem, ut utraque potius actio laesa magis fuerit, uncle brevissimo tempore miser, meo cum maximo dolore, mortem oppetiit; id quod etiam in aliis quamplurimis pueris saepius observavi, et praesertim in ejusdem Petri filiolo nepoti ex filia, quinque annorum, mihi carissima, qui post paucos dies eodem modo, quo pater, vitam cum morte mutavit. Cortes. Miscel. Med. p. 697.

Quod si enim adhaerentem adhuc crustam avellere aggrediamur, ulcerationes magis in profundum procedunt, et inflammations consequuntur, augentur dolores, et in ulcera sperentia proficiunt. Heredia, p. 109.

Heredia takes notice of the same thing, and gives it as a principal reason why so many infants and children suffered by this disease.

Infantium et puerorum multitudo maxima periit, quia nec exspuere, nec excreare lentas et crustaceas materias possunt, et minus auxiliis obediunt. p. 100.

The same caution was given by Heredia, and almost in the same terms. Cujusque rei deglutitionem praecedat excrementorum oris excreatio, detersio, ne lotion venenosa excrementa cum rebus deglutiendis ferantur ad viscera. p. 109.

. . . cum pueri nequeant gargarismatis uti, injiciantur cum syringa. Idem ibid.

Heredia, after having observed, that no evacuations by stools or sweat were of use in this disease, admits that some advantage may be expected from this discharge. Est autem aliqua spes in frequenti expuitione, quando crassa et glutinosa excreatur. p. 100.

As I had not an opportunity of seeing this author[s] works till the first pages of this edition were printed off, I could not mention him with the rest, to whom I had recourse for information respecting the symptoms at the first appearance of this disease in Europe. He was physician to Philip IV. of Spain, and in his *Disputations de Morbis acutis* printed in the third tome of his works, he treats of this disease expressly in several chapters, under the title of Angina maligna. His history of the symptoms contains several things not mentioned by any other author I have seen; so that tho' he was probably among the last of the Spanish physicians who wrote upon this subject, yet the diligence of his predecessors seems not wholly to have exhausted it. In the second edition of his works, which was that I made use of, nothing appears to determine the exact time when his account was published; but as he mentions the *Polyanthea* of De la Parra, which, according to Hen. Moreau in Bartholine[s] *Epistles,* was printed at Madrid in 1625, that it must have been after this time, is certain., This edition of Heredia was published at Lyons under the title of *Petri Michaelis de Heredia,* Complutensis, Philippi IV. *Hispaniarum regis Archiatri Operum Medicinalium Editio altera.* Lugduni 1673.

Cavendum est diligenter, ne sic affecti deglutiunt propriam salivam, quinimo ora puerorum diligentissime sunt abluenda. Mercat. p. 137.

ON PERCUSSION OF THE CHEST BY

Josef Leopold Auenbrugger, Edler von Auenbrugg.

Josef Auenbrugger (1722-1809) was an Austrian internal medicine physician. His discovery of the percussion technique for diagnosis was monumental. For half of a century his findings hardly drew any attention. Then in 1808, Napoleon's physician, Jean-Nicolas Corvisart des Marest, translated Auenbrugger's 1761, *Inventum novum ex percussione thoracis humani et signo abstrusos interni pectoris morbos detegendi,* from Latin into French, and the world took notice. His work is still extremely important and today is part of the foundation of all clinical examination. Reading the original Latin, one can see that Corvisart's translation was excellent. The following edited English version of Auenbrugger's discovery was made available by Sir John Forbes, London in 1824. (White 2009)

The Author Preface. I here present the Reader with a new sign which I have discovered for detecting diseases of the chest. This consists in the Percussion of the human thorax, whereby, according to the character of the particular sounds thence elicited, an opinion Is formed of the internal state of that cavity. In making public my discoveries respecting this matter, I have been actuated neither by an itch for writing, nor a fondness for speculation, but by the desire of submitting to my brethren the fruits of seven yearobservation and reflexion. In doing so, I have not been unconscious of the dangers I must encounter; since it has always been the fate of those who have illustrated or improved the arts and sciences by their discoveries, to be beset by envy, malice, hatred, detraction and calumny. This the common lot, I have chosen to undergo; but with the determination of refusing to every one who is actuated by such motives as these, all explanation of my doctrines. What I have written I have proved again and again, by the testimony of my own senses, and amid laborious and tedious exertions;—still guarding, on all occasions, against the seductive influence of self-love. And here, lest any one should imagine that this new sign has been thoroughly investigated, even as far as regards the diseases noticed in my Treatise, I think it necessary candidly to confess, that there still remain many defects to be remedied—and which I expect will be remedied—by careful observation and experience. Perhaps, also, the same observation

and experience may lead to the discovery of other truths, in these or other diseases, of like value in the diagnosis, prognosis and cure of thoracic affections. Owing to this acknowledged imperfection, it will be seen, that, in my difficulties, I have had recource to the Commentaries of the most illustrious Baron Van Swieten, as containing every thing which can be desired by the faithful observer of the nature; by which means I have not only avoided the vice of tedious and prolix writing, but have, at the same time, possessed myself of the firmest basis whereon to raise, most securely and creditably, the rudiments of my discovery. In submitting this to the public, I doubt not that I shall be considered, by a those who can justly appreciate medical science, as having thereby rendered a grateful service to our art,—inasmuch as it must be allowed to throw no small degree of light upon the obscurer diseases of the chest, of which a more perfect knowledge has hitherto been much wanted. In drawing up my little work I have omitted many things that were doubtful, and not sufficiently digested; to the due perfection of which it will be my endeavour henceforth to apply myself. To conclude, I have not been ambitious of ornament in my mode or style of writing, being contented if I shall be understood. December 31, 1760.

FIRST OBSERVATION. Of the natural sound of the Chest, and its character in different parts.

I. The thorax of a healthy person sounds, when struck. Scholium. I deem it unnecessary to give in this place, any description of the thorax, I think it sufficient to say, that by this term I mean that cavity bounded above by the neck and clavicles, and below by the diaphragm: in the sound state, the viscera it contains are fitted for or their respective uses. **II.** The sound thus elicited (I.) from the healthy chest, resembles the stifled sound of a drum covered with a thick woollen cloth or other envelope. **III.** This sound is perceptible on different parts of the chest in the following manner: 1. On the right side anteriorly it is observed from the clavicle to the sixth true rib; laterally, from the axilla to the seventh rib; and posteriorly from the scapula to the second and third false ribs. 2. The left side yields this sound from the clavicle to the fourth true rib, anteriorly; and on the back and laterally, in the same extent as the other side: over the space occupied by the heart the sound loses part of its usual clearness, and becomes dull. 3. The whole sternum yields as distinct a sound as the sides of the chest, except in the cardiac region where it is somewhat duller. 4. The same sound is perceptible over that part of the spinal column which contributes to form the chest. Scholium. The sound is more distinct in the lean, and proportionably duller in the robust; in very fat persons it is almost lost. The most sonorous region is from the clavicle to the fourth rib anteriorly; lower down, the mammae and pectoral muscles deaden the sound. Sometimes, owing to the presence of muscle, the sound is dull beneath the axilla. In the scapular regions on the back, owing to the obstacle afforded by the bones and thick muscles there, it is also less distinct. Sometimes, but rarely, it exists over the third false rib-owing, I conceive, to a very unwonted length of the thoracic cavity.

SECOND OBSERVATION. Of the method of Percussion.

IV. The thorax ought to be struck, slowly and gently, with the points of the fingers, brought close together and at the same time extended. Scholium. Robust and fat subjects require a stronger percussion; such, indeed, as to elicit a degree of sound equal to that produced, by a slight percussion, in a lean subject. **V.** During percussion the shirt is to be drawn tight over the chest, or the hand of the operator covered with a glove made of unpolished leather. Scholium. If the naked chest is struck by the naked hand, the contact of the polished surfaces produces a kind of noise which alters or obscures the natural character of the sound. **VI.** During the application of percussion the patient is first to go on breathing in the natural manner, and then is to hold his breath after a full inspiration. The difference of sound during inspiration, expiration, and the retention of the breath, is important in fixing our diagnosis. **VII.** While undergoing percussion on the fore parts of the chest, the patient is to hold his head erect, and the shoulders are to be thrown back; in order that the chest may protrude, and the skin and muscles be drawn tight over it: a clear sound is thus obtained. **VIII.** While we are striking the lateral parts of the chest, the patient is to hold his arms across his head; as, thereby, the thoracic parietes are made more tense, and a clearer sound obtained. **IX.** When operating on the back, you are to cause the patient to bend forwards, and draw his shoulders towards the anterior parts of the chest, so as to render the dorsal region rounded; and for the same reasons, as stated in VIII. Scholium. Any healthy person may make experience of percussion in his own person or that of other sound subjects; and will thus be convinced, from the variety of the sounds obtained, that this sign is not to be despised in forming a diagnosis.

THIRD OBSERVATION. Of the preternatural or morbid sound of the Chest, and its general import.

X. And Scholium. To be able justly to appreciate the value of the various sounds elicited from the chest in cases of disease, it is necessary to have learned by experience on many subjects, the modifications of sound, general or partial, produced by the habit of body, natural conformation as to the scapulae, mammae, the heart, the capacity of the thorax, the degree of fleshiness, fatness &c. &c. inasmuch as these various circumstances modify the sound very considerably. **XI.** If, then, a distinct sound, equal on both sides, and commensurate to the degree of percussion, is not obtained from the sonorous regions above mentioned, a morbid condition of some of the parts within the chest is indicated, Scholium. On this truth a general rule is founded, and from this certain predictions can be deduced, as will be shown in order. For I have learned from much experience that diseases of the worst description may exist within the chest, unmarked by any symptoms, and undiscoverabie by any other means than percussion alone. A clear and equal sound elicited from both sides of the chest indicates that the air cells of the lungs are free, and uncompressed either by a solid or liquid body. (Exceptions to this rule will be mentioned in their place.) **XII.** and **XIII.** If a sonorous part of the chest, struck

with the same intensity, yields a sound duller than natural, disease exists in that part. **XIV.** If a sonorous region of the chest appears, on percussion, entireiy destitute of the natural sound,—that is, if it yields only a sound like that of a fleshy limb when struck, disease exists in that region. Scholium. The nature of the indications above pointed out, will be understood by any one who attends to the difference of sound elicited by percussion of the chest, and of the thigh, in his own person. **XV.** The superficial extent of this unnatural sound (XIV.) in a sonorous region, is commensurate with the extent of the morbid affection. **XVI.** If a place, naturally sonorous, and now sounding only as a piece of flesh when struck, still retains the same sound (on percussion) when the breath is held after a deep inspiration,—we are to conclude that the disease extends deep into the cavity of the chest. **XVII.** If the same results (XVI.) are obtained both before and behind, on points precisely opposite, we are to conclude that the disease occupies the whole diameter of the chest. Scholium. These varying results depend on the greater or less diminution of the volume of air usually contained in the thorax (lungs); and the cause which occasions this diminution, whether solid or liquid, produces analogous results to those obtained by striking a cask, for example, in different degrees of emptiness or fulness: the diminution of sound being proportioned to the diminution of the volume of air contained in it.

FOURTH OBSERVATION. Of the diseases in general In which the morbid sound of the Chest is observed.

XVIII. The preternatural or morbid sound occurs in acute and chronic diseases; it always accompanies a copious effusion of fluid in the thoracic cavity. Scholium. It must be admitted that whatever diminishes the volume of air within the chest, diminishes the natural sound of that cavity; but we know from the nature, the causes, and the effects, of acute and chronic diseases of the chest, that such a result is possible in these cases; and the fact is finally demonstrated by examinations after death. The effect of effused fluids in producing the morbid sound, is at once proved by the injection of water into the thorax of a dead body; in which case it will be found that the sound elicited by percussion, will be obscure over the portion of the cavity occupied by the injected liquid.

FIFTH OBSERVATION. Of Acute diseases in which the chest yields the morbid sound.

XIX. The morbid sound which is observed in acute diseases, occurs during their progress, or at their termination. Scholium. This consideration ought to lead all medical men to use percussion in acute diseases; as they will thereby be enabled to form a more correct judgment, which in such cases is always a matter of difficulty. It has often occured to me to see cases of acute diseases, apparently over, and imposing on the physician under the mask of intermittent or remittent fevers, and which have eventually ended in a fatal vomica or fatal scirrhus of the lungs. **XX.** The preternatural

sound which is perceived during the course of acute diseases of the chest, occurs most frequently in inflammatory affections. Scholium. The reason of this observation (XX.) will be obvious to any one acquainted with the nature of inflammation. The preternatural sound may also be observed sometimes in epidemic exanthematous diseases, previously to the eruption;—as was the case in the petechial epidemic of 1757, 1758, 1759, and in the miliary epidemic of the present year (1760). In the latter instance, I observed that the preternatural sound, when once present, continued to the termination of the eruption. **XXI.** The morbid Sound which occurs towards the termination of acute diseases, is observed, when the excretion of morbid matter is not adequate to the severity of the affection. **XXII.** The morbid sound occuring in inflammatory diseases is commoniy observable on the fourth day; it rarely precedes, but often follows this period. Scholium. This sign occurs rarely on the third, and very often on the fourth, fifth, and seventh day—but never later. It is observed in those inflammatory affections of the pleura or lungs, or both, which are accompanied by a humid cough; but not in those attended by a dry cough,—such (e.g.) as the dry pleurisy, and inflammation of the mediastinum, pericardium, and heart. At least in these latter affections, the sound is not observed, until such time as they verge towards a fatal termination, or have degenerated into obvious abscesses or vomicae. **XXIII.** The morbid sound increases, from the time of its appearance, according to the nature, severity, and duration of the disease; it diminishes proportionably to the nature, duration, and copiousness of the excretions. Scholium. The progressive augmentation of the preternatural sound depends on the gradual deposition of the morbific matter, which I have often found in such quantity as to occupy the inferior two-thirds of the affected side. **XXIV.** The disease in which the preternatural sound is once present, either proves fatal [on a decretory day, reckoning from its origin]; passes off with due excretion; or terminates in other affections. **XXV.** The following corollaries are the result of my observation of inflammatory diseases of the chest, studied under the sign of morbid resonance: 1. The duller the sound, and the more nearly approaching that of a fleshy limb stricken, the more severe is the disease. 2. The more extensive the space over which the morbid sounds is perceived, the more certain is the danger from the disease. 3. The disease is more dangerous on the left than on the right side. 4. The existence of the morbid sound on the superior and anterior part of the chest (i.e. from the clavicle to the fourth rib) indicates less danger, than on the inferior parts of the chest. 5. The want of the natural sound behind, indicates more danger than it does on the anterior and superior part of the chest. 6. The total destitution of sound over one whole side, is generally (passim) a fatal sign. 7. The absence of sound along the course of the sternum is a fatal sign. 8. The entire absence of the natural sound over a large space in the region of the hearth, is a fatal sign. Scholium. I have sometimes observed that the fatal prognostics given in the corollaries 6 and 7, were not verified when the matter made its way outwards, or abscesses formed in parts less essential to life. And this natural process has been often happily imitated by the antients, by cauterising or otherwise incising, the affected parts.

SIXTH OBSERVATION. Of Chronic Diseases in which the preternatural sound is observed.

XXVI. The preternatural sound observed in chronic diseases is owing either to—(1.) some hidden condition of the organs, which disorders them with a slow progress and finally destroys them; or exists (2.) when certain obvious causes have induced a slow disorganization of the same. Scholium. These are the general sources of chronic diseases of the chest; and from whichever of the two classes of causes these arise; the morbid sound will equally and always be present. **XXVII.** The diseases of the first class are, 1. those which depend on hereditary predisposition; 2. those which arise from affections of the mind, particularly ungratified desires, the principal of which is Nostalgia; 3. those which affect certain artisans, naturally possessing weak lungs. Scholium. 1. The influence of an hereditary taint in producing diseases we know by experience, though we cannot explain it.—See Van Swiet. 2. Mental affections, we find, produce quite opposite effects, while acting as causes of pectoral diseases. Of these affections of the mind I have observed none more powerful in rendening obscure the natural resonance of the chest, than the destruction of cherished hopes. And as among this class of diseases, Nostalgia (commonly called heimwehe—home ail) occupies the first place, I shall here give a short history of it. When young men, not yet arrived at their full growth, are forcibiy impressed into the military service, and thereby at once lose all hope of returning safe and sound to their beloved home and country, they become sad, siient, listless, solitary, musing and full of sighs and moans, and finally quite regardless of, and indifferent to, all the cares and duties of life. From this state of mental disorder nothing can rouse them,—neither argument, nor promises, nor the dread of punishment; and the body gradually pines and wastes away, under the pressure of ungratified desires, and with the preternatural sound of one side of the chest. This is the disease Nostalgia. I have examined the bodies of many youths who have fallen victims to it, and have uniformly found the lungs firmly united to the pleura, and the lobes on that side where the obscure sound had existed, callous, indurated, and more or less purulent. Some years ago, this disease was very common, but is now rarely met with, since the wise arrangement has been adopted of limiting the period to military service to a certain number of years only. 3. The various arts and occupations of life have their peculiar diseases, in like manner as the ages, temperaments, and sexes have theirs. This truth is exemplified in the case of the man of letters, the husbandman, the workers in metals, painters, &c. &c. Our particular business, however, at present, is with those arts which dispose to diseases of the chest indicated by the sound so often described. Thus I have remarked that Tailors, Millers, &c. who are forced to inhale, during their labours, a fine dust, become phthisical; while shoemakers, weavers, &c. from the forced position or application of their weak chests, during their various occupations, become asthmatical, with scirrhous lungs, &c. I may here state a fact which I have frequently proved by dissection, but which I cannot well account for—it is this: in the above mentioned class of cases it is extremely rare to find both lungs affected at the same time; and, when this happens, one lung is

always more diseased than the other. **XXVIII.** The diseases mentioned (in XXVI. 2.) arise either from (1.) a vitiated condition of the fluids, gradually produced; or (2.) from acute affections imperfectly cured. Scholium. 1. The vitiation of the humours arises from ingesta which cannot be assimilated, the effect of which in producing chronic diseases is well known. 2. An acute disease is said to be imperfectly cured when some morbid affection still remains after it, in some part of the body. This morbid condition will be observed either in the site of the primary disease, or, at least, in that portion of the chest, which yields the morbid sound;—namely, the pleura, or lungs, or both these together, or the mediastinum or pericardium. When the primary inflammatory disease is succeeded by a collection of pus in the chest, the affection is readily recognized; but if the secondary affection is a scirrhus of the lung, how often and how grievously are medical men thereby deceived! Often have I met with cases of fancied convalescence from acute fevers, in which there was hardly any cough or dyspnoea, or indeed any other sign of disease (as appeared to the attendants) but a trifling degree of irregular fever. In these cases, however, on percussion the preternatural sound was found over one whole side of the chest, and the final result was death, preceded either by dropsy or extreme emaciation; the real seat of the disease remaining, perhaps, unknown to the very last! **XXIX.** For the above reasons, it may be received as a general rule in chronic diseases, that when, together with the indication stated XXVI., there are emaciation and debility,—the case is desperate. Scholium. This result is inevitable whensoever the disease doos not yield to medicine. In such cases we may always conclude, that the lung of the side which yields the preternatural sound, is either compressed by some foreign body, is indurated by disease, or destroyed by some morbid acrimony developed within its own structure.

SEVENTH OBSERVATION. Of the preternatural sound of the chest which results from copious extravasation of the fluids contained in the vessels of that cavity.

XXX. The fluids contained in the vessel of the chest are: 1. Chyle; 2. Blood; 3. Serum and Lymph. Scholium. I must candidly admit that I have never seen a case of extravasated chyle. I however believe the thing possible, although I am well aware that the thoracic duct runs outside the pleura: the same causes that produce erosion and perforation of the thoracic parietes, may produce this. **XXXI.** The extravasation of these fluids (XXX.) may arise from the following causes: 1. rupture of the conaining vessels; 2. too great tenuity of the contained fluids; 3. nonabsorption of the same &c. &c. Scholium. 1. Under this head come wounds, contusions, &c. 2. Extravasations from internal causes arise from rupture of relaxed and debilitated vessels, during a state of plethora and overactivity of the circulation. 3. A third class of causes are obstructions originating in a bad habit of body. **XXXII.** When from these causes the fluids mentioned are poured out in considerable quantity, the preternatural sound will exist over the space occupied by them. Scholium. The correctness of this statement is evinced by the experiment

mentioned at the end of the scholium of XVII. According to the plan former proposed (XI.) I shall now proceed to notice those affections of the chest which are not indicated by percussion.

EIGHTH OBSERVATION. Of those affections of the chest which are not indicated by percussion.

XXXIII. Certain diseases attended by a violent cough, and thereby creating a suspicion that the lungs are certainly implicated, are nevertheless truly diseases of the abdomen, and affect the pulmonary organs merely sympathetically. Scholium. Under this head are ranged the gastric and convulsive coughs of infants, pregnant women, and such other persons as have their abdominal viscera oppressed by the lentor of autumnal agues, or a superfluity of phlegm. **XXXIV.** Violent coughs dyspnoeas, asthmas and consumptions, are also occasionally observed, which originate in some incomprehensihle irritability of the nerves of the chest. Affections of this sort rarely give rise to the preternatural sound: from the absence of this, however, and the presence of a copious watery urine, their existence may be pretty confidently presumed. Scholium. Under this head are ranged the coughs, dyspnoeas, and asthmas so common in hysterical and hypochondriacal affections; the nervous consumption and asthma of old persons; and, perhaps we may add the polypous concretions found near the heart in young subjects. **XXXV.** A slight engorgement of the lung, a scirrhus of small extent, a small vomica, and a trifling extravasation, are not detected by percussion,—unless, sometimes, by the decreased resonance of the affected part. Scholium. These affections are not dangerous until they reach a size when they become more readily discoverable by means of percussion. **XXXVI.** There is another class of diseases of the lungs [undiscoverable by percussion] in which the distinguishing symptoms are a very severe cough, with expectoration of fatty, chalky, gypseous and stony matters. Scholium. These cases are known by the nature of the expectoration. I have frequently observed a cough of this kind (but without the peculiar expectoration) succeeding miliary fevers improperly treated.

NINTH OBSERVATION. Of the appearances on dissection, in cases where the preternatural sound of the chest had been observed.

XXXVII. These are the following: 1. Scirrhus of the lungs; 2. The conversion of this into an ichorous vomica; 3. A purulent vomica (simple or ruptured) in the pleura, lungs, mediastinum or pericardium. 4. Empyema; 5. Dropsy of the chest, in one or both cavities; 6. Dropsy of the pericardium; 7. Extensive extravasation of blood in the cavity of the pleura or pericardium; 8. Aneurism of the heart. Scholium. I will now proceed to notice diseases in order, premising, occasionally, some account of the general symptoms.

TENTH OBSERVATION. Of scirrhus of the lungs, and its symptoms.

XXXVIII. By scirrhus of the lungs I mean the degeneration of the natural spongy substance of the organ into an indolent fleshy mass. Scholium. A portion of sound lung swims in water, but this carniform degeneration sinks. There is often observed a vast difference in the character of these scirrhi, in respect of hardness, colour and component parts. Thus, in inflammatory diseases of the chest proving fatal on the fifth, seventh, or ninth day, the lung is very often found so completely gorged with blood, as to resemble liver in every respect, both as to colour and consistence. One appearance deserves to be noticed: the lung is frequently invested with a purulent adventitious membrane, in those instances wherein the fatal peripneumony has succeeded an acute pleurisy. In chronic diseases of the lungs the appearances are extremely various. Frequently they are interspersed and as it were marbled with a fatty kind of matter; frequently along with the fleshy appearance, they have the consistence of cartilage; and very often they are found indurated by means of a thickened and black blood. These varieties, doubtless, depend on varieties of the morbific matter. **XXXIX.** The presence of scirrhus of the lungs, in its primary unsoftened condition, may be suspected from the following signs: Together with the diminution or entire loss of the natural sound over the affected part, there is an infrequent cough without any expectoration, or with only a scanty excretion of viscid and crude sputa. During a state of quiescence there is nothing to be observed much amiss, either in the condition of the pulse or respiration; but upon any considerable bodily motion, or after speaking for some time, these persons become speedily exhausted, anxious, and breathless, and complain of a sense of dryness and roughness in the throat. At the same time the pulse, which had previously been of moderate frequency, becomes quick and unequal; the respiration and speech are broken and interrupted by sighs; the temporal, sublingual, and jugular veins of the affected side, are more than usually distended; while it will be observed that this side of the chest is less moveable than the other, during inspiration. Meanwhile the natural and animal functions continue to be well performed; and the patient can lie on either side indifferently. All the above symptoms are more severe in proportion as the scirrhus is more extensive.

ELEVENTH OBSERVATION. Of Vomicae in general.

XL. When an humour, sound or morbid, is deposited from the circulating mass in a solid form, and (together with the extreme vessels) is afterwards, by means of the vital powers softened and converted into matter, and contained in a sort of capsule, I term this collection of matter a Vomica. Scholium. This notion applies to every vomica, whether produced by a vice of the solids or fluids, as is clear from the history of obstruction and inflammation. **XLI.** I have observed two kinds of Vomica—the Ichorous and Purulent. The former occupies the lungs only; the latter, both the lungs and other thoracic viscera. They are both either close, or communicating with the Trachaea.

Scholium. By the term Ichorous Vomica, I mean a sac containing a thin fluid frequently of a reddish yellow colour, frequently of a reddish brown, often of a colour between these, different from pus, and arising from the destruction of a scirrhus lung. By Purulent Vomica, I understand an encysted abscess of the chest, resulting from the conversion of an inflamed spot into a white, thick, glutinous, fatty matter. When these communicate with the Bronchia and discharge any of their contents by expectoration, they are called open; otherwise, close or shut. **XLII.** 1. Ichorous Vomica. If a scirrhus of the lung, recognized by its proper signs (XXXIX.) is converted into matter, it presents the following symptoms: The patient begins to languish and waste away insensibIy (although the usual quantity of food is taken), with a quick, contracted, and unequal pulse. The respiration, even during a state of quietude is unnaturally anxious and frequent; and is remarkabiy interrupted by sighing. The forehead, during the more severe attacks, is sometimes covered with a cold sweat. The eyes are dim; the veins of the cheeks and lips are livid, and the tongue, especially on the affected side, is of a leaden hue. At the same time there is neither pain nor thirst. The diseased side, however, is observed to be less mobile than natural, and the degree of immobility is proportioned to the bulk of the vomica into which the scirrhus has been resolved. The cough is infrequent, interrupted, and dry; or the expectoration, if any, is dirty or blackish (coenosum aut fuscum). When things have got to this height, the appetite begins to fail, and at length is entirely lost; and whatever is eaten oniy produces an increase of anxiety during the process of digestion: this process, however, takes place without any hectic flushing, which always accompanies the purulent vomica. In some cases, when there is a dissolution of the central parts of the scirrhus, the abdomen and hypochondres sink in; in a very few instances, the same parts are slightly swollen, and with an indistinct feeling of fluctuation. The urine rarely presents any deviation from the natural state; sometimes, however, it is red, and with a sediment (if any exists) of a cinnabar colour. The stools are of natural character, except under the influence of medicine. The extremities, even when of a livid colour, are never hotter than natural, until a few days before death; the affected side is, moreover, observed to swell, and the hand and foot in the first place. The patient now suffers from frequent sinkings and faintings; and from having hitherto been able to lie easily on either side, he is able to remain on the affected side only. 2. Close Purulent Vomica. The following are the symptoms of this affection: While the abdominal organs still continue to perform their functions well, there is often present a very troublesome, frequent, dry cough, so severe as to irritate the fauces, to render the voice hoarse, and often to excite vomiting. At this time are observed frequent irregular chills, followed by heat, and strong flushing of the cheeks and lips, particularly of the affected side. A degree of lassitude is experienced, more remarkable after a full meal; and at the same time, there is perceived a degree of quickness and straitness of the respiration, sufficient to excite suspicion of some morbid affection of the chest. The pulse is also found to be contracted, frequent somewhat hard and unequal during the period of digestion; and even at other times it is never in a perfectly natural state,—more especially, under the influence of bodily motion, laughing, or speaking. If at this time

the Vomica has reached a size to be detected by percussion, the following additional signs exist: The patient is not nourished by the food taken, partly because it is, in a greater or less degree, rejected by vomiting, and partly on account of the imperfect assimilation of what is retained. As the disease increases, the whole process of respiration is at length carried on by one lung; an incessant state of anxiety prevails, and the patient remains fixed on the diseased side, through dread of impending suffocation if he turn on the other. The face, hands, feet, and the affected side are oedematous; while the opposite part of the body, from deficient assimiiation, hectic heat, and nocturnal perspirations, is extenuated. The urine now becomes scanty, red, turbid, with a copious branny sediment, and soon putrefies; and the scene is finally closed with short and asthmatic breathlessness, lividity of the cheeks, lips, and nails, &c. 3. Purulent Vomica communicating with the Trachea. When a Vomica of considerable size, discoverable by percussion, bursts into the Trachea, or rather Bronchia, by a large opening, it produces instant suffocation; if, by a small aperture, it is recognized by the following marks: By means of a violent cough, pus is expectorated, which is, in different cases, white, yellow, saffron, green, brown, bloody; which sinks in water, and, when thrown on hot coals, emits a stinking nidorous smell. If at this time, while the patient is coughing and spitting, the palm of the hand be placed over the site of the vomica, i. e. over the place where its existence had been detected by percussion,—the noise of fluid within the chest will be sufficiently manifest. This kind of expectoration will cease for some days, with relief to the patient; but it speedily returns, and is a preceded, for four and twenty hours, by an increase of the febrile state. During this state of things, and before the return of the expectoration, if percussion is applied over the site of the vomica a sound exactly like that from a fleshy limb is obtained; but if this is delayed until the evacuation of the accumulated pus, then there is perceived a distinct, though obtuse sound. The slow fever which invariably accompanies this condition, is encreased after eating, and is still higher during the night; and at these times, the forehead, neck, and chest, are covered with perspiration. With the increase of these symptoms, and the continuation of the purulent expectoration, the breath becomes tainted, insomuch as to be extremely disagreeable both to the patient and the attendants. The thirst continues great, but the appetite is lost, even for the greatest deiicacies, which, however sparingly taken, produce, in place of refreshment, langour and anxiety. (The case is very different with them whose sputa are inodorous, the appetite in many being even great.) The urine is uniformly frothy, grows speedily putrid, and deposits a viscid, tenacious, white sediment. The patient now daily grows more emaciated: the bones almost pierce the skin,—the hair falls off,—the nails become curved,—the legs swell; at length a colliquative diarrhaea supervening first lessens, and then suppresses the expectoration, and the sufferer finally dies suddenly, on the third day after that on which he began to remain obstinately fixed on his back, with his legs drawn under him. **XLIII.** Empyema. When a vomica (XXXVII.), ascertained by percussion, discharges its contents into the cavity of the pleura, and upon the diaphragm, Empyema is produced. Scholium. I premise this definition to prevent the affection now in question from being confounded with a vomica that has discharged

its contents into the trachaea. **XLIV.** If a large vomica, whose superficial and central extent is supposed to have been recognized by the marks pointed out (Obs. Third. XV., XVI., XVII.), shall have burst as above mentioned (XLIII.), it may be recognized by the following signs: The patient who had usually lain on the affected side, starts up with a sudden pain (as if neariy suffocated), and begs to be held in the erect posture. If percussion is now applied it will be found that the natural sound, which had been nearly lost in the site of the vomica, has in some deree been restored in that place; while it is more or less destroyed (according to the quantity of pus effused) over the posterior and inferior parts of the chest. There is now a very frequent cough, which is either dry, or with a scanty, frothy and noisy expectoration. The respiration becomes very laborious, with frequent faintings, and a cold sweat bedews the forehead and throat; the cheeks and lips are of an ominous red, while the nails grow livid, the pupils dilate, and death (which follows in a few hours the rupture of a large vomica) is finally preceded by dimness of sight, &c. A small vomica, ruptured in the same manner, produces the same symptoms, and is equally fatal. This issue, however, is of later occurrence, and is preceded by the marks of pleuro-peripneumony.

TWELFTH OBSERVATION. Of Dropsy of the Chest.

XLV. When water is collected in the cavity of the chest, between the pleura (costalis) and the lungs, the disease is called dropsy of the chest; and this is said to be of two kinds, namely, according as the fluid occupies one, or both sides. Scholium. This is ascertained by percussion in the living subject; and is demonstrated by anatomical examination after death. The general symptoms of this disease are chiefly the following: 1. Difficult and laborious respiration; 2. A cough at intervals, which is dry, or only attended by sputa of a thin watery nature, or occas ionaI somewhat viscid; 3. A pulse contracted, somewhat hard, frequent unequal, and often intermitting; 4. A sense of breathlessness and suffocation on the slightest motion; 5. An incipient dislike of warm food; 6. Perpetual anxiety about the scrobiculus cordis; 7. Great pressure on the chest, and distension of the stomach during the period of digestion; 8. A murmuring noise about the hypochondres, and frequent eructation of flatus, with momentary relief; 9. Scarcely any thirst; 10. Urine very scanty, and rarely made, red, with a lateritious sediment; 11. Swelling of the abdomen, more especially in the Epigastrium, and particularly in that point on which the incumbent water gravitates; 12. A sublivid swelling of the extremities, especially of the feet, which are moreover cold to the touch; 13. Oedematous tumescence of the inferior palpebrae 14. A pallid, or, according to the nature of the affection, a sublivid discoloration of the cheeks, lips, and tongue; 15. Inability to lie down; anxious distressing nights, with heaviness, yet frequently sleepless. All these symptoms vary in a wonderful manner according to the disease. First Kind.—Dropsy of one side of the Chest. Beside the general signs of this disease above enumerated, the affected side, if completeiy filled with water, is enfeebled (effoeminatum), and appears less moveable during inspiration. In this case, also, the affected side yields no where the natural sound on percussion. If the chest is

only half-filled, a louder sound will be obtained over the parts to which the fluid does not extend; and, in this case, the resonance will be found to vary acording to the position of the patient, and the consequent level which the liquid attains. The Hypochondre of the affected side is also unusually tumid, and more resisting to pressure than the rest of the abdomen. The palpebra, hand, and foot of the affected side are slightly oedematous. It is a remarkable fact, that the reclining posture (decubitus declivis) is easily borne when the chest is entirely full; while the contrary is the case, when there remains space for the fluctuation of the water. Second Kind.—Dropsy of both sides of the Chest. If fluid is contained in both sides of the chest, the following specific signs, in addition to the general symptoms, exist: The natural sound is destroyed over the space occupied by the water in either side. The patients uniformly become asthmatic; and resemble, in many respects, those labouring under Ascites, ony that the former have their inferior palpebrae and hands swollen. They cannot lie in an horizontal posture, and are equaliy threatened with suffocation on whichever side they turn; on which account, they are forced to remain sitting, day and night, to prevent the pressure of the fluid from being felt on the upper parts of the chest (which would be the case on lying down), in the same degree on which it now gravitates on the abdomen. The effect of this state of things might lead to the suspicion of Ascites, only that we find, on examining the patient in the erect position, that the hypochondriac regions are more swollen than the inferior parts, which is not the case in Ascites. All these subjects die as if from peripneumony, that is to say,—the pulse fails, the whole body, except the chest and head, grows cold, the cheeks and extremities become livid, the respiration is at first laborious, then interrupted, and finally ceases altogether. **XLVI.** Dropsy of the Pericardium. When the liquor pericardii is morbidiy encreased, so as to be capable of disturbing the natural action of the heart, the disease is called Dropsy of the Pericardium: of this there are two species, as the fiuid is purulent or serous. Scholium. The fluid naturally present in the pericardium accumulates in still greater quantity in those who suffer a long protracted mortal agony, as we find on examination after their death. But it is not to this accumulation, originating in the relaxation of death, but to that produced by obstruction during life, that I apply the term dropsy. I have ventured to divide the affection into two species, because I have often witnessed both of them. In the first variety, the heart is rough, and as it were shagged, with a coating of the purulent matter; while in the latter, the organ is only of a paler colour than natural. Many may be of opinion that the purulent dropsy would be better classed under the head of Empyema; but I shall never quarrel about words, when there are appearances to instruct us. Signs of Hydropericardium. Almost all the symptoms which have already been enumerated as accompanying dropsy of the chest generally accompany this species also: in addition to these, however, I have observed the following specific signs of the dropsy of the pericardium: The sound in the cardiac region, which I have already stated (III. 2. 3.) to be naturaily more obscure than in the other parts of the chest; is now as completely deadened as if the percussion were applied to a fleshy limb. A swelling is perceived in the praecordia, which can readily be distinguished, by its superior resistance, from the stomach distended by flatus. The

patients fall asleep, while sitting, the body being inclined forwards; but they soon are roused by the unconscious dropping of the head. On this account, they complain to all around them of the distressing propensity to sleep which they experience. At the same time they suffer from faintings (accompanied by a pulse frequently unequal in respect both of its rythm and volume), and, indeed continue to undergo to the end of their wretched life, and in every position of body, the greatest distress. A few days before death, in many cases, the neck is swollen, and the eyes become extremely red, as if from crying. This state of things is sometimes terminated suddenly by a stroke of apoplexy, or more slowly by leipothymia. The same signs are furnished by percussion in the purulent, as in the proper dropsy of the pericardium; but in the former, the other symptoms are precisely the same as those which exist in the close purulent vomica. In the purulent dropsy, the fluid commonly resembles turbid whey,—the thicker portions of it (quod purulentum est) being found adhering to the heart like fringes.

THIRTEENTH OBSERVATION. Of the symptoms of a copious extravasation of Blood.

XLVII. The causes of a large extravasation of blood into the cavity of the chest have been noticed in the Scholium of XXXI. The foliowing are the symptoms of this affection. Scholium. There is incessant and indiscribable anxiety and oppression at the praecordia and on the chest, while there is constant jactitation of the body, and complete intolerance of the horizontal posture. Percussion elicits none of the natural sound over the space occupied by the extravasated blood. In all cases the pulse is extremely contracted, frequent, and irregular in every way. The respiration is extremely laborious, with a frequent cough, and broken by profound sighing. All the veins become flaccid, and the eyes are at first red but ultimately pale. Cold sweats &c. follow, and the patient dies stertorous. These are the symptoms when the blood flows into the cavity of the pleura without any accompanying lesion of the lungs: when these are wounded, there is also bloody expectoration, and a passage of air to and from the wound in the parietes of the chest.

FOURTEENTH OBSERVATION. Aneurism of the Heart.

XLVIII. When the heart becomes so much distended by blood, accumulated in its auricles and ventricles, as to be unequal to propel forward its contents, it frequently becomes thereby enormously dilated. This dilatation has been called Aneurism of the Heart. Scholium. We frequently observe this state of the heart on dissection, (1.) in sudden and extensive peripneumonies of both lobes at the same time, and (2.) in those fatal inflammatory diseases which are noticed towards the end of the Scholium on XXII. The pathognomonic sign of this affection is the complete fleshy sound on percussion existing over a considerable space in the region of the heart. Whenever this sound is perceptible in the acute peripneumony it is a sign that the patient will not

survive twenty-four hours: in fact, he is already at the last gasp, and is speedily carried off as in apoplexy, unconscious of his fate. In the second class of inflammations, the sign is equally fatal, but is attended by different symptoms. In this case, the patients suffer dreadfull anxiety, and by the constant jactitation of their limbs, are perpetually uncovering themselves. Older persons, indeed bear more tranquilly their sufferings; but the younger are pertinaciously restless and violent, struggling and talking, attempting to get out of bed, demanding their clothes, and endeavouring to walk or go about their usual occupations. Meanwhile the eyes become dull, the cheeks livid, and the nails and extremities are tinged with a leaden hue, and death is ushered in by cold sweats, and the gradual extinction of the pulse and respiration.

CHICKEN POX

William Heberden

William Heberden (1710-1801) was a brilliant English physician. He was the first to differentiate chicken-pox from smallpox. Heberden showed how chicken-pox was a mild disease and stressed that a person who has had chicken-pox remained immune. In his clinical notes he did not mention that there was a cross-immunity from cowpox, which seemed to render some farmhands who had vaccinia less liable to contract smallpox. This early work was not first seen in 1818 in the Commentaries on the History and Cure of Diseases, Boston, Wellys and Lilly, p. 361. as thought by many, but was originally published in1768 in the Medical Transactions of the Royal College of Physicians of London, under the title: *On the Chicken-pox.* Vol1: pp. 427-436. Both versions were used to edit this edition. (White 2009)

VARIOLAE PUSILLAE. THE CHICKEN POX

The chicken pox and swine pox differ, I believe, only in name: they occasion so little danger or trouble to the patients, that physicians are seldom sent for to them, and have therefore very few opportunities of seeing this distemper. Hence it happens that the name of it is met with in very few books, and hardly any pretend to say a word of its history.

But though it be so insignificant an illness, that an acquaintance with it is not so much use for its own sake, yet it is of importance on account of the small pox, with which it may otherwise be confounded, and so deceive the persons, who have had it, into a false security, which may prevent them either from keeping out of the way of the small pox, or from being inoculated. For this reason I have judged it might be useful to contribute, what I have learned from experience, towards its description,

These pocks break out in many without any illness or previous sign: in others they are preceded by a little degree of chillness, lassitude, cough, broken sleep, wandering pains, loss of appetite, and feverishness for three days.

In some patients I have observed them to make their first appearance on the back, but this perhaps is not constant. Most of them are of the common size of the small pox, but some are less. I never saw them confluent, nor very numerous. The greatest number, which I ever observed, was about twelve in the face, and two hundred over the rest of the body.

On the first day of the eruption they are reddish. On the second day there is at the top of most of them a very small bladder, about the size of a millet-seed. This is sometimes full of a watery and colourless, sometimes of a yellowish liquor, contained between the cuticle and skin. On the second, or, at the farthest, on the third day from the beginning of the eruption, as many of these pocks, as are not broken, seem arrived at their maturity; and those which are fullest of that yellow liquor, very much resemble what the genuine small pox are on the fifth or sixth day, especially where there happens to be a larger space than ordinary occupied by the extravasated serum. It happens to most of them, either on the first day that this little bladder arises, or on the day after, that its tender cuticle is burst by the accidental rubbing of the clothes, or by the patient's hands to allay the itching which attends this eruption. A thin scab is then formed at the top of the pock, and the swelling of the other part abates, without its ever being turned into pus, as it is in the small pox. Some few escape being burst; and the little drop of liquor contained in the vesicle at the top of them grows yellow and thick, and dries into a scab. On the fifth day of the eruption they are almost all dried and covered with a slight crust. The inflammation of these pocks is very small, and the contents of them do not seem to be owing to suppuration, as in the small pox, but rather to what is extravasated immediately under the cuticle by the serous vessels of the skin, as in a common blister. No wonder therefore that this liquor appears so soon as on the second day, and that upon the cuticle being broken it is presently succeeded by a slight scab: hence too, as the true skin is so little affected, no mark or scar is likely to be left, unless in one or two pocks, where, either by being accidentally much fretted, or by some extraordinary sharpness of the contents, a little ulcer is formed in the skin.

The patients scarce suffer any thing throughout the whole progress of this illness, except some languidness of strength and spirits and appetite, all which may probably be owing to the confining of them-selves to their chamber. I saw two children ill of the chicken pox, whose mother chose to be with them, though she had never had this illness. Upon the eighth or ninth day after the pocks were at their height in the children, the mother fell ill of this distemper then beginning to show itself. In this instance the infection lay in the body much about the same time that it is known to do in the small pox.

Remedies are not likely to be much wanted in a disease attended with hardly any inconvenience, and which in so short a time is certainly cured of itself.

The principal marks, by which the chicken pox may be distinguished from the small pox are.

The appearance on the second or third day from the eruption of that vesicle full of serum upon the top of the pock.

The crust, which covers the pocks on the fifth day; at which time those of the small pox are not at the height of their suppuration.

Foreign medical writers hardly ever mention the name of this distemper; and the writers of our own country scarce mention any thing more of it, than in name. Morton speaks of it as if he supposed it to be a very mild genuine small pox. But these two

distempers are surely totally different from one another, not only on account of their different appearances above mentioned, but because those, who have had small pox, are capable of being infected with chicken pox; but those, who have once had the chicken pox, are not capable of having it again, though to such, as have never had this distemper, it seems as infectious as the small pox. I wetted a thread in the most concocted pus-like liquor of the chicken-pox which I could find; and after making a slight incision, it was confined upon the arm of one who had formerly had it; the little wound healed up immediately, and shewed no signs of an infection. From the great similitude between the two distempers, it is probable, that, instead of the small pox, some persons have been inoculated from the chicken pox, and that the distemper which has succeeded, has been mistaken for the small pox by hasty and unexperienced observers.

There is sometimes seen an eruption, concerning which I have been in doubt, whether it be one of the many unnoticed cutaneous diseases, or only, as I am rather inclined to believe, a more malignant sort of chicken pox.

This disorder is preceded for three or four days by all the symptoms which forerun the chicken pox, but in a much higher degree. On the fourth or fifth day the eruption appears, with very little abatement of the fever; the pains likewise of the limbs and back still continue, to which are joined pains of the gums. The pocks are redder than the chicken pox, and spread wider, and hardly rise so high, at least not in proportion to their size. Instead of one little head or vesicle of a serous matter, these have from four to ten or twelve. They go off just like the chicken pox, and are distinguishable from the small pox by the same marks; besides which the continuance of the pains and fever after the eruption, and the degree of both these, though there be not above twenty pocks, are, as far as I have seen, what never happen to the small pox.

Many foreigners seem so little to have attended to the peculiar characteristics of the small pox, particularly the length of time, which it requires to its full maturation, that we may the less wonder at the prevailing opinion among them, that the same person is liable to have it several times. Petrus Borellus' records the case of a woman, who had this distemper seven times, and catching it again died of it the eighth time. It would be no extravagant assertion to say, that here in England not above one in ten thousand patients is pretended to have had it twice; and wherever it is pretended, it will always be as likely that the persons about the patient were mistaken, and supposed that to be the small pox, which was an eruption of a different nature, as that there was such an extraordinary exception to what we are sure is so general a law.

NOTES

Hist. and Obs. Rar. Med. Phys., centur. iii. obs. 10.

AN INQUIRY INTO THE CAUSES AND EFFECTS OF THE VARIOLÆ VACCINÆ, OR COW-POX PART I. 1798

Edward Jenner, FRS

This is an edited version of the three original publications on the vaccination against smallpox, by Edward Jenner (1749-1823). His first letters and essays on the use of vaccination were never published and his results and theory were vehemently opposed; and only through his continued efforts vaccination finally gained recognition and saved more lives than any other practice the world had seen. These excerpts are from a collection of his works published as Jenner, Edward. *The Three Original Publications on Vaccination Against Smallpox.* Vol. XXXVIII, Part 4. The Harvard Classics. New York: P.F. Collier & Son, 1909 14. (White 2009)

Edward Jenner was born at his father's vicarage at Berkeley, Gloucestershire, England, on May 17, 1749. After leaving school, he was apprenticed to a local surgeon, and in 1770 he went to London and became a resident pupil under the great surgeon and anatomist, John Hunter, with whom he remained on intimate terms for the rest of Hunter's life. In 1773 he took up practice at Berkeley, where, except for numerous visits to London, he spent the rest of his life. He died of apoplexy on January 26, 1823.

Jenner's scientific interests were varied, but the importance of his work in vaccination has overshadowed his other results. Early in his career he had begun to observe the phenomena of cowpox, a disease common in the rural parts of the western counties of England, and he was familiar with the belief, current among the peasantry, that a person who had suffered from the cowpox could not take smallpox. Finally, in 1796, he made his first experiment in vaccination, inoculating a boy of eight with cowpox, and,safter his recovery, with smallpox; with the result that the boy did not take the latter disease.

Jenner's first paper on his discovery was never printed; but in 1798 appeared the first of the following treatises. Its reception by the medical profession was highly discouraging; but progress began when Cline, the surgeon of St. Thomas's Hospital, used the treatment with success. Jenner continued his investigations, publishing his results from time to time, and gradually gaining recognition; though opposition to his theory and practice was at first vehement, and has never entirely disappeared. In 1802, Parliament voted him 10,000, and in 1806, 20,000, in recognition of the value of his services, and the sacrifices they had entailed. As early as 1807, Bavaria made vaccination compulsory;

and since that date most of the European governments have officially encouraged or compelled the practice; and smallpox has ceased to be the almost universal scourge it was before Jenner's discovery.

Part I. 1798

THE DEVIATION of man from the state in which he was originally placed by nature seems to have proved to him a prolific source of diseases. From the love of splendour, from the indulgences of luxury, and from his fondness for amusement he has familiarised himself with a great number of animals, which may not originally have been intended for his associates.

The wolf, disarmed of ferocity, is now pillowed in the lady's lap. The cat, the little tiger of our island, whose natural home is the forest, is equally domesticated and caressed. The cow, the hog, the sheep, and the horse, are all, for a variety of purposes, brought under his care and dominion.

There is a disease to which the horse, from his state of domestication, is frequently subject. The farriers have called it *the grease.* It is an inflammation and swelling in the heel, from which issues matter possessing properties of a very peculiar kind, which seems capable of generating a disease in the human body (after it has undergone the modification which I shall presently speak of), which bears so strong a resemblance to the smallpox that I think it highly probable it may be the source of the disease.

In this dairy country a great number of cows are kept, and the office of milking is performed indiscriminately by men and maid servants. One of the former having been appointed to apply dressings to the heels of a horse affected with the grease, and not paying due attention to cleanliness, incautiously bears his part in milking the cows, with some particles of the infectious matter adhering to his fingers. When this is the case, it commonly happens that a disease is communicated to the cows, and from the cows to the dairymaids, which spreads through the farm until the most of the cattle and domestics feel its unpleasant consequences. This disease has obtained the name of the cow-pox. It appears on the nipples of the cows in the form of irregular pustules. At their first appearance they are commonly of a palish blue, or rather of a colour somewhat approaching to livid, and are surrounded by an erysipelatous inflammation. These pustules, unless a timely remedy be applied, frequently degenerate into phagedenic ulcers, which prove extremely troublesome. The animals become indisposed, and the secretion of milk is much lessened. Inflamed spots now begin to appear on different parts of the hands of the domestics employed in milking, and sometimes on the wrists, which quickly run on to suppuration, first assuming the appearance of the small vesications produced by a burn. Most commonly they appear about the joints of the fingers and at their extremities; but whatever parts are affected, if the situation will admit, these superficial suppurations put on a circular form, with their edges more elevated than their centre, and of a colour distantly approaching to blue. Absorption takes place, and

tumours appear in each axilla. The system becomes affected—the pulse is quickened; and shiverings, succeeded by heat, with general lassitude and pains about the loins and limbs, with vomiting, come on. The head is painful, and the patient is now and then even affected with delirium. These symptoms, varying in their degrees of violence, generally continue from one day to three or four, leaving ulcerated sores about the hands, which, from the sensibility of the parts, are very troublesome, and commonly heal slowly, frequently becoming phagedenic, like those from whence they sprung. The lips, nostrils, eyelids, and other parts of the body are sometimes affected with sores; but these evidently arise from their being heedlessly rubbed or scratched with the patient's infected fingers. No eruptions on the skin have followed the decline of the feverish symptoms in any instance that has come under my inspection, one only excepted, and in this case a very few appeared on the arms: they were very minute, of a vivid red colour, and soon died away without advancing to maturation; so that I cannot determine whether they had any connection with the preceding symptoms.

Thus the disease makes its progress from the horse to the nipple of the cow, and from the cow to the human subject.

Morbid matter of various kinds, when absorbed into the system, may produce effects in some degree similar; but what renders the cow-pox virus so extremely singular is that the person who has been thus affected is forever after secure from the infection of the small-pox; neither exposure to the variolous effluvia, nor the insertion of the matter into the skin, producing this distemper.

In support of so extraordinary a fact, I shall lay before my reader a great number of instances.

CASE I. Joseph Merret, now an under gardener to the Earl of Berkeley, lived as a servant with a farmer near this place in the year 1770, and occasionally assisted in milking his master's cows. Several horses belonging to the farm began to have sore heels, which Merret frequently attended. The cows soon became affected with the cow-pox, and soon after several sores appeared on his hands. Swellings and stiffness in each axilla followed, and he was so much indisposed for several days as to be incapable of pursuing his ordinary employment. Previously to the appearance of the distemper among the cows there was no fresh cow brought into the farm, nor any servant employed who was affected with the cow-pox.

In April, 1795, a general inoculation taking place here, Merret was inoculated with his family; so that a period of twenty-five years had elapsed from his having the cow-pox to this time. However, though the variolous matter was repeatedly inserted into his arm, I found it impracticable to infect him with it; an efflorescence only, taking on an erysipelatous look about the centre, appearing on the skin near the punctured parts. During the whole time that his family had the smallpox, one of whom had it very full, he remained in the house with them, but received no injury from exposure to the contagion.

It is necessary to observe that the utmost care was taken to ascertain, with the most scrupulous precision, that no one whose case is here adduced had gone through the smallpox previous to these attempts to produce that disease.

Had these experiments been conducted in a large city, or in a populous neighbourhood, some doubts might have been entertained; but here, where population is thin, and where such an event as a person's having had the smallpox is always faithfully recorded, no risk of inaccuracy in this particular can arise.

CASE II. Sarah Portlock, of this place, was infected with the cow-pox when a servant at a farmer's in the neighbourhood, twenty-seven years ago.

In the year 1792, conceiving herself, from this circumstance, secure from the infection of the smallpox, she nursed one of her own children who had accidentally caught the disease, but no indisposition ensued. During the time she remained in the infected room, variolous matter was inserted into both her arms, but without any further effect than in the preceding case.

CASE III. John Phillips, a tradesman of this town, had the cow-pox at so early a period as nine years of age. At the age of sixty-two I inoculated him, and was very careful in selecting matter in its most active state. It was taken from the arm of a boy just before the commencement of the eruptive fever, and instantly inserted. It very speedily produced a sting-like feel in the part. An efflorescence appeared, which on the fourth day was rather extensive, and some degree of pain and stiffness were felt about the shoulder: but on the fifth day these symptoms began to disappear, and in a day or two after went entirely off, without producing any effect on the system.

CASE IV. Mary Barge, of Woodford, in this parish, was inoculated with variolous matter in the year 1791. An efflorescence of a palish red colour soon appeared about the parts where the matter was inserted, and spread itself rather extensively, but died away in a few days without producing any variolous symptoms. She has since been repeatedly employed as a nurse to smallpox patients, without experiencing any ill consequences. This woman had the cow-pox when she lived in the service of a farmer in this parish thirty-one years before.

CASE V. Mrs. H, a respectable gentlewoman of this town, had the cow-pox when very young. She received the infection in rather an uncommon manner: it was given by means of her handling some of the same utensils which were in use among the servants of the family, who had the disease from milking infected cows. Her hands had many of the cow-pox sores upon them, and they were communicated to her nose, which became inflamed and very much swollen. Soon after this event Mrs. H was exposed to the contagion of the smallpox, where it was scarcely possible for her to have escaped, had she been susceptible of it, as she regularly attended a relative who had the disease in so violent a degree that it proved fatal to him.

In the year 1778 the smallpox prevailed very much at Berkeley, and Mrs. H, not feeling perfectly satisfied respecting her safety (no indisposition having followed her exposure to the smallpox), I inoculated her with active variolous matter. The same appearance followed as in the preceding cases—an efflorescence on the arm without any effect on the constitution.

CASE VI. It is a fact so well known among our dairy farmers that those who have had the smallpox either escape the cow-pox or are disposed to have it slightly, that as soon as the complaint shews itself among the cattle, assistants are procured, if possible, who are thus rendered less susceptible of it, otherwise the business of the farm could scarcely go forward.

In the month of May, 1796, the cow-pox broke out at Mr. Baker's, a farmer who lives near this place. The disease was communicated by means of a cow which was purchased in an infected state at a neighbouring fair, and not one of the farmer's cows (consisting of thirty) which were at that time milked escaped the contagion. The family consisted of a man servant, two dairymaids, and a servant boy, who, with the farmer himself, were twice a day employed in milking the cattle. The whole of this family, except Sarah Wynne, one of the dairymaids, had gone through the smallpox. The consequence was that the farmer and the servant boy escaped the infection of the cow-pox entirely, and the servant man and one of the maid servants had each of them nothing more than a sore on one of their fingers, which produced no disorder in the system. But the other dairymaid, Sarah Wynne, who never had the smallpox, did not escape in so easy a manner. She caught the complaint from the cows, and was affected with the symptoms described on page 146 in so violent a degree that she was confined to her bed, and rendered incapable for several days of pursuing her ordinary vocations in the farm.

March 28th, 1797, I inoculated this girl and carefully rubbed the variolous matter into two slight incisions made upon the left arm. A little inflammation appeared in the usual manner around the parts where the matter was inserted, but so early as the fifth day it vanished entirely without producing any effect on the system.

CASE VII. Although the preceding history pretty clearly evinces that the constitution is far less susceptible of the contagion of the cow-pox after it has felt that of the smallpox, and although in general, as I have observed, they who have had the smallpox, and are employed in milking cows which are infected with the cow-pox, either escape the disorder, or have sores on the hands without feeling any general indisposition, yet the animal economy is subject to some variation in this respect, which the following relation will point out:

> In the summer of the year 1796 the cow-pox appeared at the farm of Mr. Andrews, a considerable dairy adjoining to the town of Berkeley. It was communicated, as in the preceding instance, by an infected cow purchased at a fair in the neighbourhood. The family consisted of the farmer, his wife,

> two sons, a man and a maid servant; all of whom, except the farmer (who was fearful of the consequences), bore a part in milking the cows. The whole of them, exclusive of the man servant, had regularly gone through the smallpox; but in this case no one who milked the cows escaped the contagion. All of them had sores upon their hands, and some degree of general indisposition, preceded by pains and tumours in the axillæ: but there was no comparison in the severity of the disease as it was felt by the servant man, who had escaped the smallpox, and by those of the family who had not, for, while he was confined to his bed, they were able, without much inconvenience, to follow their ordinary business.

February the 13th, 1797, I availed myself of an opportunity of inoculating William Rodway, the servant man above alluded to. Variolous matter was inserted into both his arms: in the right, by means of superficial incisions, and into the left by slight punctures into the cutis. Both were perceptibly inflamed on the third day. After this the inflammation about the punctures soon died away, but a small appearance of erysipelas was manifest about the edges of the incisions till the eighth day, when a little uneasiness was felt for the space of half an hour in the right axilla. The inflammation then hastily disappeared without producing the most distant mark of affection of the system.

CASE VIII. Elizabeth Wynne, aged fifty-seven, lived as a servant with a neighbouring farmer thirty-eight years ago. She was then a dairymaid, and the cow-pox broke out among the cows. She caught the disease with the rest of the family, but, compared with them, had it in a very slight degree, one very small sore only breaking out on the little finger of her left hand, and scarcely any perceptible indisposition following it.

As the malady had shewn itself in so slight a manner, and as it had taken place at so distant a period of her life, I was happy with the opportunity of trying the effects of variolous matter upon her constitution, and on the 28th of March, 1797, I inoculated her by making two superficial incisions on the left arm, on which the matter was cautiously rubbed. A little efflorescence soon appeared, and a tingling sensation was felt about the parts where the matter was inserted until the third day, when both began to subside, and so early as the fifth day it was evident that no indisposition would follow.

CASE IX. Although the cow-pox shields the constitution from the smallpox, and the smallpox proves a protection against its own future poison, yet it appears that the human body is again and again susceptible of the infectious matter of the cow-pox, as the following history will demonstrate.

William Smith, of Pyrton in this parish, contracted this disease when he lived with a neighbouring farmer in the year 1780. One of the horses belonging to the farm had sore heels, and it fell to his lot to attend him. By these means the infection was carried to the cows, and from the cows it was communicated to Smith. On one of his hands

were several ulcerated sores, and he was affected with such symptoms as have been before described.

In the year 1791 the cow-pox broke out at another farm where he then lived as a servant, and he became affected with it a second time; and in the year 1794 he was so unfortunate as to catch it again. The disease was equally as severe the second and third time as it was on the first.

In the spring of the year 1795 he was twice inoculated, but no affection of the system could be produced from the variolous matter; and he has since associated with those who had the smallpox in its most contagious state without feeling any effect from it.

CASE X. Simon Nichols lived as a servant with Mr. Bromedge, a gentleman who resides on his own farm in this parish, in the year 1782. He was employed in applying dressings to the sore heels of one of his master's horses, and at the same time assisted in milking the cows. The cows became affected in consequence, but the disease did not shew itself on their nipples till several weeks after he had begun to dress the horse. He quitted Mr. Bromedge's service, and went to another farm without any sores upon him; but here his hands soon began to be affected in the common way, and he was much indisposed with the usual symptoms. Concealing the nature of the malady from Mr. Cole, his new master, and being there also employed in milking, the cow-pox was communicated to the cows.

Some years afterward Nichols was employed in a farm where the smallpox broke out, when I inoculated him with several other patients, with whom he continued during the whole time of their confinement. His arm inflamed, but neither the inflammation nor his associating with the inoculated family produced the least effect upon his constitution.

CASE XI. William Stinchcomb was a fellow servant with Nichols at Mr. Bromedge's farm at the time the cattle had the cow-pox, and he was, unfortunately, infected by them. His left hand was very severely affected with several corroding ulcers, and a tumour of considerable size appeared in the axilla of that side. His right hand had only one small tumour upon it, and no tumour discovered itself in the corresponding axilla.

In the year 1792 Stinchcomb was inoculated with variolous matter, but no consequences ensued beyond a little inflammation in the arm for a few days. A large party were inoculated at the same time, some of whom had the disease in a more violent degree than is commonly seen from inoculation. He purposely associated with them, but could not receive the smallpox.

During the sickening of some of his companions their symptoms so strongly recalled to his mind his own state when sickening with the cow-pox that he very pertinently remarked their striking similarity.

CASE XII. The paupers of the village of Tortworth, in this county, were inoculated by Mr. Henry Jenner, Surgeon, of Berkeley, in the year 1795. Among them, eight patients presented themselves who had at different periods of their lives had the cow-pox. One

of them, Hester Walkley, I attended with that disease when she lived in the service of a farmer in the same village in the year 1782; but neither this woman, nor any other of the patients who had gone through the cow-pox, received the variolous infection either from the arm or from mixing in the society of the other patients who were inoculated at the same time. This state of security proved a fortunate circumstance, as many of the poor women were at the same time in a state of pregnancy.

CASE XIII. One instance has occurred to me of the system being affected from the matter issuing from the heels of horses, and of its remaining afterwards unsusceptible of the variolous contagion; another, where the smallpox appeared obscurely; and a third, in which its complete existence was positively ascertained.

First, Thomas Pearce is the son of a smith and farrier near to this place. He never had the cow-pox; but, in consequence of dressing horses with sore heels at his father's, when a lad, he had sores on his fingers which suppurated, and which occasioned a pretty severe indisposition. Six years afterwards I inserted variolous matter into his arm repeatedly, without being able to produce any thing more than slight inflammation, which appeared very soon after the matter was applied, and afterwards I exposed him to the contagion of the smallpox with as little effect.

CASE XIV. Secondly, Mr. James Cole, a farmer in this parish, had a disease from the same source as related in the preceding case, and some years after was inoculated with variolous matter. He had a little pain in the axilla and felt a slight indisposition for three or four hours. A few eruptions shewed themselves on the forehead, but they very soon disappeared without advancing to maturation.

CASE XV. Although in the former instances the system seemed to be secured, or nearly so, from variolous infection, by the absorption of matter from the sores produced by the diseased heels of horses, yet the following case decisively proves that this cannot be entirely relied upon until a disease has been generated by the morbid matter from the horse on the nipple of the cow, and passed through that medium to the human subject.

Mr. Abraham Riddiford, a farmer at Stone in this parish, in consequence of dressing a mare that had sore heels, was affected with very painful sores in both his hands, tumours in each axilla, and severe and general indisposition. A surgeon in the neighbourhood attended him, who knowing the similarity between the appearance of the sores upon his hands and those produced by the cow-pox, and being acquainted also with the effects of that disease on the human constitution, assured him that he never need to fear the infection of the smallpox; but this assertion proved fallacious, for, on being exposed to the infection upwards of twenty years afterwards, he caught the disease, which took its regular course in a very mild way. There certainly was a difference perceptible, although it is not easy to describe it, in the general appearance of the pustules from that which we commonly see. Other practitioners who visited the patient at my request agreed with

me in this point, though there was no room left for suspicion as to the reality of the disease, as I inoculated some of his family from the pustules, who had the smallpox, with its usual appearances, in consequence.

CASE XVI. Sarah Nelmes, a dairymaid at a farmer's near this place, was infected with the cow-pox from her master's cows in May, 1796. She received the infection on a part of her hand which had been previously in a slight degree injured by a scratch from a thorn. A large pustulous sore and the usual symptoms accompanying the disease were produced in consequence. The pustule was so expressive of the true character of the cow-pox, as it commonly appears upon the hand, that I have given a representation of it in the annexed plate. [In original.] The two small pustules on the wrists arose also from the application of the virus to some minute abrasions of the cuticle, but the livid tint, if they ever had any, was not conspicuous at the time I saw the patient. The pustule on the forefinger shews the disease in an earlier stage. It did not actually appear on the hand of this young woman, but was taken from that of another, and is annexed for the purpose of representing the malady after it has newly appeared.

CASE XVII. The more accurately to observe the progress of the infection I selected a healthy boy, about eight years old, for the purpose of inoculation for the cow-pox. The matter was taken from a sore on the hand of a dairymaid, who was infected by her master's cows, and it was inserted, on the 14th of May, 1796, into the arm of the boy by means of two superficial incisions, barely penetrating the cutis, each about half an inch long.

On the seventh day he complained of uneasiness in the axilla, and on the ninth he became a little chilly, lost his appetite, and had a slight headache. During the whole of this day he was perceptibly indisposed, and spent the night with some degree of restlessness, but on the day following he was perfectly well.

The appearance of the incisions in their progress to a state of maturation were much the same as when produced in a similar manner by variolous matter. The only difference which I perceived was in the state of the limpid fluid arising from the action of the virus, which assumed rather a darker hue, and in that of the efflorescence spreading round the incisions, which had more of an erysipelatous look than we commonly perceive when variolous matter has been made use of in the same manner; but the whole died away (leaving on the inoculated parts scabs and subsequent eschars) without giving me or my patient the least trouble.

In order to ascertain whether the boy, after feeling so slight an affection of the system from the cow-pox virus, was secure from the contagion of the smallpox, he was inoculated the 1st of July following with variolous matter, immediately taken from a pustule. Several slight punctures and incisions were made on both his arms, and the matter was carefully inserted, but no disease followed. The same appearances were observable on the arms as we commonly see when a patient has had variolous matter applied, after having either the cow-pox or smallpox. Several months afterwards he

was again inoculated with variolous matter, but no sensible effect was produced on the constitution.

Here my researches were interrupted till the spring of the year 1798, when, from the wetness of the early part of the season, many of the farmers' horses in this neighbourhood were affected with sore heels, in consequence of which the cow-pox broke out among several of our dairies, which afforded me an opportunity of making further observations upon this curious disease.

A mare, the property of a person who keeps a dairy in a neighbouring parish, began to have sore heels the latter end of the month of February, 1798, which were occasionally washed by the servant men of the farm, Thomas Virgoe, William Wherret, and William Haynes, who in consequence became affected with sores in their hands, followed by inflamed lymphatic glands in the arms and axillæ, shiverings succeeded by heat, lassitude, and general pains in the limbs. A single paroxysm terminated the disease; for within twenty-four hours they were free from general indisposition, nothing remaining but the sores on their hands. Haynes and Virgoe, who had gone through the smallpox from inoculation, described their feelings as very similar to those which affected them on sickening with that malady. Wherret never had had the smallpox. Haynes was daily employed as one of the milkers at the farm, and the disease began to shew itself among the cows about ten days after he first assisted in washing the mare's heels. Their nipples became sore in the usual way, with bluish pustules; but as remedies were early applied, they did not ulcerate to any extent.

CASE XVIII. John Baker, a child of five years old, was inoculated March 16, 1798, with matter taken from a pustule on the hand of Thomas Virgoe, one of the servants who had been infected from the mare's heels. He became ill on the sixth day with symptoms similar to those excited by cow-pox matter. On the eighth day he was free from indisposition.

There was some variation in the appearance of the pustule on the arm. Although it somewhat resembled a smallpox pustule, yet its similitude was not so conspicuous as when excited by matter from the nipple of the cow, or when the matter has passed from thence through the medium of the human subject.

This experiment was made to ascertain the progress and subsequent effects of the disease when thus propagated. We have seen that the virus from the horse, when it proves infectious to the human subject, is not to be relied upon as rendering the system secure from variolous infection, but that the matter produced by it upon the nipple of the cow is perfectly so. Whether its passing from the horse through the human constitution, as in the present instance, will produce a similar effect, remains to be decided. This would now have been effected, but the boy was rendered unfit for inoculation from having felt the effects of a contagious fever in a workhouse soon after this experiment was made.

CASE XIX. William Summers, a child of five years and a half old, was inoculated the same day with Baker, with matter taken from the nipples of one of the infected cows, at

the farm alluded to. He became indisposed on the sixth day, vomited once, and felt the usual slight symptoms till the eighth day, when he appeared perfectly well. The progress of the pustule, formed by the infection of the virus, was similar to that noticed in Case XVII, with this exception, its being free from the livid tint observed in that instance.

CASE XX. From William Summers the disease was transferred to William Pead, a boy of eight years old, who was inoculated March 28th. On the sixth day he complained of pain in the axilla, and on the seventh was affected with the common symptoms of a patient sickening with the smallpox from inoculation, which did not terminate till the third day after the seizure. So perfect was the similarity to the variolous fever that I was induced to examine the skin, conceiving there might have been some eruptions, but none appeared. The efflorescent blush around the part punctured in the boy's arm was so truly characteristic of that which appears on variolous inoculation that I have given a representation of it. [In original.] The drawing was made when the pustule was beginning to die away and the areola retiring from the centre.

CASE XXI. April 5th: Several children and adults were inoculated from the arm of William Pead. The greater part of them sickened on the sixth day, and were well on the seventh, but in three of the number a secondary indisposition arose in consequence of an extensive erysipelatous inflammation which appeared on the inoculated arms. It seemed to arise from the state of the pustule, which spread out, accompanied with some degree of pain, to about half the diameter of a sixpence. One of these patients was an infant of half a year old. By the application of mercurial ointment to the inflamed parts (a treatment recommended under similar circumstances in the inoculated smallpox) the complaint subsided without giving much trouble.

Hannah Excell, an healthy girl of seven years old, and one of the patients above mentioned, received the infection from the insertion of the virus under the cuticle of the arm in three distinct points. The pustules which arose in consequence so much resembled, on the twelfth day, those appearing from the infection of variolous matter, that an experienced inoculator would scarcely have discovered a shade of difference at that period. Experience now tells me that almost the only variation which follows consists in the pustulous fluids remaining limpid nearly to the time of its total disappearance; and not, as in the direct smallpox, becoming purulent.

CASE XXII. From the arm of this girl matter was taken and inserted April 12th into the arms of John Marklove, one year and a half old, Robert F. Jenner, eleven months old, Mary Pead, five years old, and Mary James, six years old.

Among these, Robert F. Jenner did not receive the infection. The arms of the other three inflamed properly and began to affect the system in the usual manner; but being under some apprehensions from the preceding cases that a troublesome erysipeals might arise, I determined on making an experiment with the view of cutting off its

source. Accordingly, after the patients had felt an indisposition of about twelve hours, I applied in two of these cases out of the three, on the vesicle formed by the virus, a little mild caustic, composed of equal parts of quick-lime and soap, and suffered it to remain on the part six hours. It seemed to give the children but little uneasiness, and effectually answered my intention in preventing the appearance of erysipelas. Indeed, it seemed to do more, for in half an hour after its application the indisposition of the children ceased. These precautions were perhaps unnecessary, as the arm of the third child, Mary Pead, which was suffered to take its common course, scabbed quickly, without any erysipelas.

CASE XXIII. From this child's arm matter was taken and transferred to that of J. Barge, a boy of seven years old. He sickened on the eighth day, went through the disease with the usual slight symptoms, and without any inflammation on the arm beyond the common efflorescence surrounding the pustule, an appearance so often seen in inoculated smallpox.

After the many fruitless attempts to give the smallpox to those who had had the cow-pox, it did not appear necessary, nor was it convenient to me, to inoculate the whole of those who had been the subjects of these late trials; yet I thought it right to see the effects of variolous matter on some of them, particularly William Summers, the first of these patients who had been infected with matter taken from the cow. He was, therefore, inoculated with variolous matter from a fresh pustule; but, as in the preceding cases, the system did not feel the effects of it in the smallest degree. I had an opportunity also of having this boy and William Pead inoculated by my nephew, Mr. Henry Jenner, whose report to me is as follows: I have inoculated Pead and Barge, two of the boys whom you lately infected with the cow-pox. On the second day the incisions were inflamed and there was a pale inflammatory stain around them. On the third day these appearances were still increasing and their arms itched considerably. On the fourth day the inflammation was evidently subsiding, and on the sixth day it was scarcely perceptible. No symptom of indisposition followed.

To convince myself that the variolous matter made use of was in a perfect state I at the same time inoculated a patient with some of it who never had gone through the cow-pox, and it produced the smallpox in the usual regular manner.

These experiments afforded me much satisfaction; they proved that the matter, in passing from one human subject to another, through five gradations, lost none of its original properties, J. Barge being the fifth who received the infection successively from William Summers, the boy to whom it was communicated from the cow.

I shall now conclude this inquiry with some general observations on the subject, and on some others which are interwoven with it.

Although I presume it may be unnecessary to produce further testimony in support of my assertion that the cow-pox protects the human constitution from the infection of the smallpox, yet it affords me considerable satisfaction to say that Lord Somerville, the President of the Board of Agriculture, to whom this paper was shewn by Sir Joseph

Banks, has found upon inquiry that the statements were confirmed by the concurring testimony of Mr. Dolland, a surgeon, who resides in a dairy country remote from this, in which these observations were made. With respect to the opinion adduced that the source of the infection is a peculiar morbid matter arising in the horse, although I have not been able to prove it from actual experiments conducted immediately under my own eye, yet the evidence I have adduced appears sufficient to establish it.

They who are not in the habit of conducting experiments may not be aware of the coincidence of circumstances necessary for their being managed so as to prove perfectly decisive; nor how often men engaged in professional pursuits are liable to interruptions which disappoint them almost at the instant of their being accomplished: however, I feel no room for hesitation respecting the common origin of the disease, being well convinced that it never appears among the cows (except it can be traced to a cow introduced among the general herd which has been previously infected, or to an infected servant) unless they have been milked by some one who, at the same time, has the care of a horse affected with diseased heels.

The spring of the year 1797, which I intended particularly to have devoted to the completion of this investigation, proved, from its dryness, remarkably adverse to my wishes; for it frequently happens, while the farmers' horses are exposed to the cold rains which fall at that season, that their heels become diseased, and no cow-pox then appeared in the neighbourhood.

The active quality of the virus from the horses' heels is greatly increased after it has acted on the nipples of the cow, as it rarely happens that the horse affects his dresser with sores, and as rarely that a milkmaid escapes the infection when she milks infected cows. It is most active at the commencement of the disease, even before it has acquired a pus-like appearance; indeed, I am not confident whether this property in the matter does not entirely cease as soon as it is secreted in the form of pus. I am induced to think it does cease, and that it is the thin, darkish-looking fluid only, oozing from the newly-formed cracks in the heels, similar to what sometimes appears from erysipelatous blisters, which gives the disease. Nor am I certain that the nipples of the cows are at all times in a state to receive the infection. The appearance of the disease in the spring and the early part of the summer, when they are disposed to be affected with spontaneous eruptions so much more frequently than at other seasons, induces me to think that the virus from the horse must be received upon them when they are in this state, in order to produce effects: experiments, however, must determine these points. But it is clear that when the cow-pox virus is once generated, that the cows cannot resist the contagion, in whatever state their nipples may chance to be, if they are milked with an infected hand.Whether the matter, either from the cow or the horse, will affect the sound skin of the human body, I cannot positively determine; probably it will not, unless on those parts where the cuticle is extremely thin, as on the lips, for example. I have known an instance of a poor girl who produced an ulceration on her lip by frequently holding her finger to her mouth to cool the raging of a cow-pox sore by blowing upon it. The hands of the farmers' servants here, from the nature of their

employments, are constantly exposed to those injuries which occasion abrasions of the cuticle, to punctures from thorns, and such like accidents; so that they are always in a state to feel the consequence of exposure to infectious matter.

It is singular to observe that the cow-pox virus, although it renders the constitution unsusceptible of the variolous, should nevertheless, leave it unchanged with respect to its own action. I have already produced an instance to point out this, and shall now corroborate it with another.

Elizabeth Wynne, who had the cow-pox in the year 1759, was inoculated with variolous matter, without effect, in the year 1797, and again caught the cow-pox in the year 1798. When I saw her, which was on the eighth day after she received the infection, I found her affected with general lassitude, shiverings, alternating with heat, coldness of the extremities, and a quick and irregular pulse. These symptoms were preceded by a pain in the axilla. On her hand was one large pustulous sore, which resembled that delineated in Plate No. 1. (Plate appears in original.)

It is curious also to observe that the virus, which with respect to its effects is undetermined and uncertain previously to its passing from the horse through the medium of the cow, should then not only become more active, but should invariably and completely possess those specific properties which induce in the human constitution symptoms similar to those of the variolous fever, and effect in it that peculiar change which for ever renders it unsusceptible of the variolous contagion.

May it not then be reasonably conjectured that the source of the smallpox is morbid matter of a peculiar kind, generated by a disease in the horse, and that accidental circumstances may have again and again arisen, still working new changes upon it until it has acquired the contagious and malignant form under which we now commonly see it making its devastations amongst us? And, from a consideration of the change which the infectious matter undergoes from producing a disease on the cow, may we not conceive that many contagious diseases, now prevalent among us, may owe their present appearance not to a simple, but to a compound, origin? For example, is it difficult to imagine that the measles, the scarlet fever, and the ulcerous sore throat with a spotted skin have all sprung from the same source, assuming some variety in their forms according to the nature of their new combinations? The same question will apply respecting the origin of many other contagious diseases which bear a strong analogy to each other.

There are certainly more forms than one, without considering the common variation between the confluent and distinct, in which the smallpox appears in what is called the natural way. About seven years ago a species of smallpox spread through many of the towns and villages of this part of Gloucestershire: it was of so mild a nature that a fatal instance was scarcely ever heard of, and consequently so little dreaded by the lower orders of the community that they scrupled not to hold the same intercourse with each other as if no infectious disease had been present among them. I never saw nor heard of an instance of its being confluent. The most accurate manner, perhaps, in which I can convey an idea of it is by saying that had fifty individuals been taken promiscuously and infected by exposure to this contagion, they would have had as mild and light a disease as

if they had been inoculated with variolous matter in the usual way. The harmless manner in which it shewed itself could not arise from any peculiarity either in the season or the weather, for I watched its progress upwards of a year without perceiving any variation in its general appearance. I consider it then as a *variety* of the smallpox.

In some of the preceding cases I have noticed the attention that was paid to the state of the variolous matter previous to the experiment of inserting it into the arms of those who had gone through the cow-pox. This I conceived to be of great importance in conducting these experiments, and, were it always properly attended to by those who inoculate for the smallpox, it might prevent much subsequent mischief and confusion. With the view of enforcing so necessary a precaution I shall take the liberty of digressing so far as to point out some unpleasant facts relative to mismanagement in this particular, which have fallen under my own observation.

A medical gentleman (now no more), who for many years inoculated in this neighbourhood, frequently preserved the variolous matter intended for his use on a piece of lint or cotton, which, in its fluid state, was put into a vial, corked, and conveyed into a warm pocket; a situation certainly favourable for speedily producing putrefaction in it. In this state (not unfrequently after it had been taken several days from the pustules) it was inserted into the arms of his patients, and brought on inflammation of the incised parts, swellings of the axillary glands, fever, and sometimes eruptions. But what was this disease? Certainly not the smallpox; for the matter having from putrefaction lost or suffered a derangement in its specific properties, was no longer capable of producing that malady, those who had been inoculated in this manner being as much subject to the contagion of the smallpox as if they had never been under the influence of this artificial disease; and many, unfortunately, fell victims to it, who thought themselves in perfect security. The same unfortunate circumstance of giving a disease, supposed to be the smallpox, with inefficacious variolous matter, having occurred under the direction of some other practitioners within my knowledge, and probably from the same incautious method of securing the variolous matter, I avail myself of this opportunity of mentioning what I conceive to be of great importance; and, as a further cautionary hint, I shall again digress so far as to add another observation on the subject of inoculation.

Whether it be yet ascertained by experiment that the quantity of variolous matter inserted into the skin makes any difference with respect to the subsequent mildness or violence of the disease, I know not; but I have the strongest reason for supposing that if either the punctures or incisions be made so deep as to go *through* it and wound the adipose membrane, that the risk of bringing on a violent disease is greatly increased. I have known an inoculator whose practice was to cut deep enough (to use his own expression) to see a bit of fat, and there to lodge the matter. The great number of bad cases, independent of inflammations and abscesses on the arms, and the fatality which attended this practice, was almost inconceivable; and I cannot account for it on any other principle than that of the matter being placed in this situation instead of the skin.

It was the practice of another, whom I well remember, to pinch up a small portion of the skin on the arms of his patients and to pass through it a needle, with a thread attached

to it previously dipped in variolous matter. The thread was lodged in the perforated part, and consequently left in contact with the cellular membrane. This practice was attended with the same ill success as the former. Although it is very improbable that any one would now inoculate in this rude way by design, yet these observations may tend to place a double guard over the lancet, when infants, whose skins are comparatively so very thin, fall under the care of the inoculator.

A very respectable friend of mine, Dr. Hardwicke, of Sodbury in this county, inoculated great numbers of patients previous to the introduction of the more modern method by Sutton, and with such success that a fatal instance occurred as rarely as since that method has been adopted. It was the doctor's practice to make as slight an incision as possible *upon* the skin, and there to lodge a thread saturated with the variolous matter. When his patients became indisposed, agreeably to the custom then prevailing, they were directed to go to bed and were kept moderately warm. Is it not probable then that the success of the modern practice may depend more upon the method of invariably depositing the virus in or upon the skin, than on the subsequent treatment of the disease?

I do not mean to insinuate that exposure to cool air, and suffering the patient to drink cold water when hot and thirsty, may not moderate the eruptive symptoms and lessen the number of pustules; yet, to repeat my former observation, I cannot account for the uninterrupted success, or nearly so, of one practitioner, and the wretched state of the patients under the care of another, where, in both instances, the general treatment did not differ essentially, without conceiving it to arise from the different modes of inserting the matter for the purpose of producing the disease. As it is not the identical matter inserted which is absorbed into the constitution, but that which is, by some peculiar process in the animal economy, generated by it, is it not probable that different parts of the human body may prepare or modify the virus differently? Although the skin, for example, adipose membrane, or mucous membranes are all capable of producing the variolous virus by the stimulus given by the particles originally deposited upon them, yet I am induced to conceive that each of these parts is capable of producing some variation in the qualities of the matter previous to its affecting the constitution. What else can constitute the difference between the smallpox when communicated casually or in what has been termed the natural way, or when brought on artificially through the medium of the skin?

After all, are the variolous particles, possessing their true specific and contagious principles, ever taken up and conveyed by the lymphatics unchanged into the blood vessels? I imagine not. Were this the case, should we not find the blood sufficiently loaded with them in some stages of the smallpox to communicate the disease by inserting it under the cuticle, or by spreading it on the surface of an ulcer? Yet experiments have determined the impracticability of its being given in this way; although it has been proved that variolous matter, when much diluted with water and applied to the skin in the usual manner, will produce the disease. But it would be digressing beyond a proper boundary to go minutely into this subject here.

At what period the cow-pox was first noticed here is not upon record. Our oldest farmers were not unacquainted with it in their earliest days, when it appeared among their farms without any deviation from the phænomena which it now exhibits. Its connection with the smallpox seems to have been unknown to them. Probably the general introduction of inoculation first occasioned the discovery.

Its rise in this country may not have been of very remote date, as the practice of milking cows might formerly have been in the hands of women only; which I believe is the case now in some other dairy countries, and, consequently, that the cows might not in former times have been exposed to the contagious matter brought by the men servants from the heels of horses. Indeed, a knowledge of the source of the infection is new in the minds of most of the farmers in this neighbourhood, but it has at length produced good consequences; and it seems probable, from the precautions they are now disposed to adopt, that the appearance of the cow-pox here may either be entirely extinguished or become extremely rare.

Should it be asked whether this investigation is a matter of mere curiosity, or whether it tends to any beneficial purpose, I should answer that, notwithstanding the happy effects of inoculation, with all the improvements which the practice has received since its first introduction into this country, it not very unfrequently produces deformity of the skin, and sometimes, under the best management, proves fatal.

These circumstances must naturally create in every instance some degree of painful solicitude for its consequences. But as I have never known fatal effects arise from the cow-pox, even when impressed in the most unfavourable manner, producing extensive inflammations and suppurations on the hands; and as it clearly appears that this disease leaves the constitution in a state of perfect security from the infection of the smallpox, may we not infer that a mode of inoculation may be introduced preferable to that at present adopted, especially among those families which, from previous circumstances, we may judge to be predisposed to have the disease unfavourably? It is an excess in the number of pustules which we chiefly dread in the smallpox; but in the cow-pox no pustules appear, nor does it seem possible for the contagious matter to produce the disease from effluvia, or by any other means than contact, and that probably not simply between the virus and the cuticle; so that a single individual in a family might at any time receive it without the risk of infecting the rest or of spreading a distemper that fills a country with terror.

Several instances have come under my observation which justify the assertion that the disease cannot be propagated by effluvia. The first boy whom I inoculated with the matter of cow-pox slept in a bed, while the experiment was going forward, with two children who never had gone through either that disease or the smallpox, without infecting either of them.

A young woman who had the cow-pox to a great extent, several sores which maturated having appeared on the hands and wrists, slept in the same bed with a fellow-dairymaid who never had been infected with either the cow-pox or the smallpox, but no indisposition followed.

Another instance has occurred of a young woman on whose hands were several large suppurations from the cow-pox, who was at the same time a daily nurse to an infant, but the complaint was not communicated to the child.

In some other points of view the inoculation of this disease appears preferable to the variolous inoculation.

In constitutions predisposed to scrophula, how frequently we see the inoculated smallpox rouse into activity that distressful malady! This circumstance does not seem to depend on the manner in which the distemper has shewn itself, for it has as frequently happened among those who have had it mildly as when it has appeared in the contrary way.

There are many who, from some peculiarity in the habit, resist the common effects of variolous matter inserted into the skin, and who are in consequence haunted through life with the distressing idea of being insecure from subsequent infection. A ready mode of dissipating anxiety originating from such a cause must now appear obvious. And, as we have seen that the constitution may at any time be made to feel the febrile attack of cow-pox, might it not, in many chronic diseases, be introduced into the system, with the probability of affording relief, upon well-known physiological principles?

Although I say the system may at any time be made to feel the febrile attack of cow-pox, yet I have a single instance before me where the virus acted locally only, but it is not in the least probable that the same person would resist the action both of the cow-pox virus and the variolous.

Elizabeth Sarfenet lived as a dairymaid at Newpark farm, in this parish. All the cows and the servants employed in milking had the cow-pox; but this woman, though she had several sores upon her fingers, felt no tumours in the axillæ, nor any general indisposition. On being afterwards casually exposed to variolous infection, she had the smallpox in a mild way. Hannah Pick, another of the dairymaids who was a fellow-servant with Elizabeth Sarfenet when the distemper broke out at the farm, was, at the same time, infected; but this young woman had not only sores upon her hands, but felt herself also much indisposed for a day or two. After this, I made several attempts to give her the smallpox by inoculation, but they all proved fruitless. From the former case then we see that the animal economy is subject to the same laws in one disease as the other.

The following case, which has very lately occurred, renders it highly probable that not only the heels of the horse, but other parts of the body of that animal, are capable of generating the virus which produces the cow-pox.

An extensive inflammation of the erysipelatous kind appeared without any apparent cause upon the upper part of the thigh of a sucking colt, the property of Mr. Millet, a farmer at Rockhampton, a village near Berkeley. The inflammation continued several weeks, and at length terminated in the formation of three or four small abscesses. The inflamed parts were fomented, and dressings were applied by some of the same persons who were employed in milking the cows. The number of cows milked was twenty-four, and the whole of them had the cow-pox. The milkers, consisting of the farmer's wife, a man and a maid servant, were infected by the cows. The man-servant had previously

gone through the small-pox, and felt but little of the cow-pox. The servant maid had some years before been infected with the cow-pox, and she also felt it now in a slight degree; but the farmer's wife, who never had gone through either of the diseases, felt its effects very severely.

That the disease produced upon the cows by the colt and from thence conveyed to those who milked them was the true and not the spurious cow-pox, there can be scarcely any room for suspicion; yet it would have been more completely satisfactory had the effects of variolous matter been ascertained on the farmer's wife, but there was a peculiarity in her situation which prevented my making the experiment.

Thus far have I proceeded in an inquiry founded, as it must appear, on the basis of experiment; in which, however, conjecture has been occasionally admitted in order to present to persons well situated for such discussions, objects for a more minute investigation. In the mean time I shall myself continue to prosecute this inquiry, encouraged by the hope of its becoming essentially beneficial to mankind.

Further Observations on the Variolæ Vaccinæ, or Cow-Pox Part II. 1799

Edward Jenner, FRS

ALTHOUGH it has not been in my power to extend the inquiry into the causes and effects of the variolæ vaccinæ much beyond its original limits, yet, perceiving that it is beginning to excite a general spirit of investigation, I think it of importance, without delay, to communicate such facts as have since occurred, and to point out the fallacious sources from whence a disease imitative of the true variolæ vaccinæ might arise, with the view of preventing those who may inoculate from producing a spurious disease; and, further, to enforce the precaution suggested in the former treatise on the subject, of subduing the inoculated pustule as soon as it has sufficiently produced its influence on the constitution. From a want of due discrimination of the real existence of the disease, either in the brute or in the human subject, and also of that stage of it in which it is capable of producing the change in the animal economy which renders it unsusceptible of the contagion of the smallpox, unpleasant consequences might ensue, the source of which, perhaps, might not be suspected by one inexperienced in conducting such experiments.

My late publication contains a relation of most of the facts which had come under my own inspection at the time it was written, interspersed with some conjectural observations. Since then Dr. G. Pearson has established an inquiry into the validity of my principal assertion, the result of which cannot but be highly flattering to my feelings. It contains not a single case which I think can be called an exception to the fact I was so firmly impressed with that the cow-pox protects the human body from the smallpox. I have myself received some further confirmations, which shall be subjoined. I have lately also been favoured with a letter from a gentleman of great respectability (Dr.

Ingenhousz), informing me that, on making an inquiry into the subject in the county of Wilts, he discovered that a farmer near Calne had been infected with the smallpox after having had the cow-pox, and that the disease in each instance was so strongly characterized as to render the facts incontrovertible. The cow-pox, it seems, from the doctor's information, was communicated to the farmer from his cows at the time that they gave out an offensive stench from their udders.

Some other instances have likewise been represented to me of the appearance of the disease, apparently marked with its characteristic symptoms, and yet that the patients have afterwards had the smallpox. On these cases I shall, for the present, suspend any particular remarks, but hope that the general observations I have to offer in the sequel will prove of sufficient weight to render the idea of their ever having had existence, but as cases of spurious cow-pox, extremely doubtful.

Ere I proceed let me be permitted to observe that truth, in this and every other physiological inquiry that has occupied my attention, has ever been the object of my pursuit, and should it appear in the present instance that I have been led into error, fond as I may appear of the offspring of my labours, I had rather see it perish at once than exist and do a public injury.

I shall proceed to enumerate the sources, or what appear to me as such, of a spurious cow-pox.

Firstly: That arising from pustules on the nipples or udder of the cow; which pustules contain no specific virus.

Secondly: From matter (although originally possessing the specific virus) which has suffered a decomposition, either from putrefaction or from any other cause less obvious to the senses.

Thirdly: From matter taken from an ulcer in an advanced stage, which ulcer arose from a true cow-pock.

Fourthly: From matter produced on the human skin from contact with some peculiar morbid matter generated by a horse.

On these subjects I shall offer some comments: First, to what length pustulous diseases of the udder and nipples of the cow may extend it is not in my power to determine; but certain it is that these parts of the animal are subject to some variety of maladies of this nature; and as many of these eruptions (probably all of them) are capable of giving a disease to the human body, would it not be discreet for those engaged in this investigation to suspend controversy and cavil until they can ascertain with precision what is and what is not the genuine cow-pox?

For example: A farmer who is not conversant with any of these maladies, but who may have heard of the cow-pox in general terms, may acquaint a neighbouring surgeon that the distemper appears at his farm. The surgeon, eager to make an experiment, takes

away matter, inoculates, produces a sore, uneasiness in the axilla, and perhaps some affection of the system. This is one way in which a fallacious idea of security both in the mind of the inoculator and the patient may arise; for a disease may thus have been propagated from a simple eruption only.

One of the first objects then of this pursuit, as I have observed, should be, to learn how to distinguish with accuracy between that peculiar pustule which is the true cow-pock, and that which is spurious. Until experience has determined this, we view our object through a mist. Let us, for instance, suppose that the smallpox and the chicken-pox were at the same time to spread among the inhabitants of a country which had never been visited by either of these distempers, and where they were quite unknown before: what confusion would arise! The resemblance between the symptoms of the eruptive fever and between the pustules in either case would be so striking that a patient who had gone through the chicken-pox to any extent would feel equally easy with regard to his future security from the smallpox as the person who had actually passed through that disease. Time and future observation would draw the line of distinction.

So I presume it will be with the cow-pox until it is more generally understood. All cavilling, therefore, on the mere report of those who tell us they have had this distemper, and are afterwards found susceptible of the smallpox, should be suspended. To illustrate this I beg leave to give the following history:

> Sarah Merlin, of the parish of Eastington in this county, when about thirteen or fourteen years of age lived as a servant with farmer Clarke, who kept a dairy consisting of about eighteen cows at Stonehouse, a neighbouring village. The nipples and udders of three of the cows were extensively affected with large white blisters. These cows the girl milked daily, and at the time she assisted, with two others, in milking the rest of the herd. It soon appeared that the disease was communicated to the girl. The rest of the cows escaped the infection, although they were milked several days after the three above specified, had these eruptions on the nipples and udders, and even after the girl's hand became sore. The two others who were engaged in milking, although they milked the cows indiscriminately, received no injury. On the fingers of each of the girl's hands there appeared several large white blisters she supposes about three or four on each finger. The hands and arms inflamed and swelled, but no constitutional indisposition followed. The sores were anointed with some domestic ointment and got well without ulcerating.

As this malady was called the cow-pox, and recorded as such in the mind of the patient, she became regardless of the smallpox; but, on being exposed to it some years afterwards she was infected, and had a full burthen.

Now, had any one conversant with the habits of the disease heard this history, they would have had no hesitation in pronouncing it a case of spurious cow-pox; considering its deviation in the numerous blisters which appeared on the girl's hands; their termination

without ulceration; its not proving more generally contagious at the farm, either among the cattle or those employed in milking; and considering also that the patient felt no general indisposition, although there was so great a number of vesicles.

This is perhaps the most deceptious form in which an eruptive disease can be communicated from the cow, and it certainly requires some attention in discriminating it. The most perfect criterion by which the judgment may be guided is perhaps that adopted by those who attend infected cattle. These white blisters on the nipples, they say, never eat into the fleshy parts like those which are commonly of a bluish cast, and which constitute the true cow-pox, but that they affect the skin only, quickly end in scabs, and are not nearly so infectious.

That which appeared to me as one cause of spurious eruptions, I have already remarked in the former treatise, namely, the transition that the cow makes in the spring from a poor to a nutritious diet, and from the udder's becoming at this time more vascular than usual for the supply of milk. But there is another source of inflammation and pustules which I believe is not uncommon in all the dairy counties in the west of England. A cow intended to be exposed for sale, having naturally a small udder, is previously for a day or two neither milked artificially nor is her calf suffered to have access to her. Thus the milk is preternaturally accumulated, and the udder and nipples become greatly distended. The consequences frequently are inflammation and eruptions which maturate.

Whether a disease generated in this way has the power of affecting the constitution in any peculiar manner I cannot presume positively to determine. It has been conjectured to have been a cause of the true cow-pox, though my inquiries have not led me to adopt this supposition in any one instance; on the contrary, I have known the milkers affected by it, but always found that an affection thus induced left the system as susceptible of the smallpox as before.

What is advanced in my second position I consider also of very great importance, and I could wish it to be strongly impressed on the minds of all who may be disposed to conclude hastily on my observations, whether engaged in their investigation by experiments or not. To place this in its clearest point of view (as the similarity between the action of the smallpox and the cow-pox matter is so obvious) it will be necessary to consider what we sometimes observe to take place in inoculation for the smallpox when imperfect variolous matter is made use of. The concise history on this subject that was brought forward respecting what I had observed in this neighbourhood I perceive, by a reference since made to the Memoirs of the Medical Society of London, may be considered as no more than a corroboration of the facts very clearly detailed by Mr. Kite. To this copious evidence I have to add still more in the following communications from Mr. Earle, surgeon, of Frampton-upon-Severn, in this county, which I deem the more valuable, as he has with much candour permitted me to make them public:

> SIR:
>
> I have read with satisfaction your late publication on the Variolæ Vaccinæ, and being, among many other curious circumstances, particularly struck with

that relating to the inefficacy of smallpox matter in a particular state, I think it proper to lay before you the following facts which came within my own knowledge, and which certainly tend to strengthen the opinions advanced in pages 56 and 57 of your treatise.

In March, 1784, a general inoculation took place at Arlingham in this county. I inoculated several patients with active variolous matter, all of whom had the disease in a favourable way; but the matter being all used, and not being able to procure any more in the state I wished, I was under the necessity of taking it from a pustule which, experience has since proved, was advanced too far to answer the purpose I intended. Of five persons inoculated with this last matter, four took the smallpox afterwards in the natural way, one of whom died, three recovered, and the other, being cautioned by me to avoid as much as possible the chance of catching it, escaped from the disease through life. He died of another disorder about two years ago.

Although one of these cases ended unfortunate, yet I cannot suppose that any medical man will think me careless or inattentive in their management; for I conceive the appearances were such as might have induced any one to suppose that the persons were perfectly safe from future infection. Inflammation in every case took place in the arm, and fever came on with a considerable degree of pain in the axilla. In some of their arms the inflammation and suppuration were more violent than is commonly observed when perfect matter is made use of; in one there was an ulcer which cast off several large sloughs. About the ninth day eruptions appeared, which died away earlier than common without maturation. From these circumstances I should suppose that no medical practitioner would scarcely have entertained a doubt but that these patients had been infected with a true smallpox; yet I must confess that some small degree of doubt presented itself to me at the speedy disappearance of the eruptions; and in order, as far as I could, to ascertain their safety, I sent one of them to a much older practitioner than myself. This gentleman, on hearing the circumstances of the case, pronounced the patient perfectly secure from future infection.

The following facts are also a striking proof of the truth of your observations on this subject:

In the year 1789 I inoculated three children of Mr. Coaley, of Hurst farm in this county. The arms inflamed properly, fever and pain in the axillæ came on precisely the same as in the former cases, and in ten days eruptions appeared, which disappeared in the course of two days. I must observe that the matter here made use of was procured for me by a friend; but no doubt it was in an improper state; for, from the similarity of these cases to those which happened at Arlingham five years before, I was somewhat alarmed for their safety, and desired to inoculate them again: which being permitted, I was particularly

careful to procure matter in its most perfect state. All the children took the smallpox from this second inoculation, and all had a very full burthen. These facts I conceive strikingly corroborate your opinion relative to the different states of matter; for in both instances that I have mentioned it was capable of producing something strongly resembling the true smallpox, although it afterwards proved not to be so.

As I think the communication of these cases is a duty I owe to the public, you are at liberty to make what use you please of this letter.

I remain, &c.,John Earle.
FRAMPTON-UPON SEVERN,
GLOUCESTERSHIRE, November 10, 1798.

P. S. I think it necessary to observe that I can pronounce, with the greatest certainty, that the matter with which the Arlingham patients were inoculated was taken from a true smallpox pustule. I took it myself from a subject that had a very full burthen

Certain then it is that variolous matter may undergo such a change from the putrefactive process, as well as from some of the more obscure and latent processes of nature, as will render it incapable of giving the smallpox in such a manner as to secure the human constitution from future infection, although we see at the same time it is capable of exciting a disease which bears so strong a resemblance to it as to produce inflammation and matter in the incised skin (frequently, indeed, more violent than when it produces its effects perfectly), swelling of the axillary glands, general indisposition, and eruptions. So strongly persuaded was the gentleman, whose practice I have mentioned in page 51 of the late treatise, that he could produce a mild smallpox by his mode of managing the matter, that he spoke of it as a useful discovery until convinced of his error by the fatal consequence which ensued.

After this ought we to be in the smallest degree surprised to find, among a great number of individuals who, by living in dairies, have been casually exposed to the cow-pox virus when in a state analogous to that of the smallpox above described, some who may have had the disease so imperfectly as not to render them secure from variolous attacks? For the matter, when burst from the pustules on the nipples of the cow, by being exposed, from its lodgment there, to the heat of an inflamed surface, and from being at the same time in a situation to be occasionally moistened with milk, is often likely to be in a state conducive to putrefaction; and thus, under some modification of decomposition, it must, of course, sometimes find access to the hand of the milker in such a way as to infect him. What confusion should we have were there no other mode of inoculating the smallpox than such as would happen from handling the diseased skin of a person labouring under that distemper in some of its advanced and loathsome stages! It must be observed that every case of cow-pox in the human species, whether

communicated by design or otherwise, is to be considered as a case of inoculation. And here I may be allowed to make an observation on the case of the farmer communicated to me by Dr. Ingenhousz. That he was exposed to the matter when it had undergone the putrefactive change is highly probable from the doctor's observing that the sick cows at the farm gave out an offensive stench from their udders. However, I must remark that it is unusual for cattle to suffer to such an extent, when disordered with the cow-pox, as to make a bystander sensible of any ill smell. I have often stood among a herd which had the distemper without being conscious of its presence from any particular effluvia. Indeed, in this neighbourhood it commonly receives an early check from escharotic applications of the cow leech. It has been conceived to be contagious without contact; but this idea cannot be well founded because the cattle in one meadow do not infect those in another (although there may be no other partition than a hedge) unless they be handled or milked by those who bring the infectious matter with them; and of course, the smallest particle imaginable, when applied to a part susceptible of its influence, may produce the effect. Among the human species it appears to be very clear that the disease is produced by contact only. All my attempts, at least, to communicate it by effluvia have hitherto proved ineffectual.

As well as the perfect change from that state in which variolous matter is capable of producing full and decisive effects on the constitution, to that wherein its specific properties are entirely lost, it may reasonably be supposed that it is capable of undergoing a variety of intermediate changes. The following singular occurrences in ten cases of inoculation, obligingly communicated to me by Mr. Trye, Senior Surgeon to the Infirmary at Gloucester, seem to indicate that the variolous matter, previously to its being taken from the patient for the intended purpose, was beginning to part with some of its original properties, or, in other words, that it had suffered a partial decomposition. Mr. Trye says: I inoculated ten children with matter taken at one time and from the same subject. I observed no peculiarity in any of them previously to their inoculation, nor did anything remarkable appear in their arms till after the decline of the disease. Two infants of three months old had erysipelas about the incisions, in one of them extending from the shoulders to the fingers' ends. Another infant had abscesses in the cellular substance in the neighbourhood of the incisions, and five or six of the rest had axillary abscesses. The matter was taken from the distinct smallpox late in its progress, and when some pustules had been dried. It was received upon glass and slowly dried by the fire. All the children had pustules which maturated, so that I suppose them all secure from future infection; at least, as secure as any others whom I have ever inoculated. My practice never afforded a sore arm before.

In regard to my former observation on the improper and dangerous mode of preserving variolous matter, I shall here remark that it seems not to have been clearly understood. Finding that it has been confounded with the more eligible modes of preservation, I will explain myself further. When the matter is taken from a fit pustule and properly prepared for preservation, it may certainly be kept without losing its specific properties a great length of time; for instance, when it is previously dried in the open air

on some compact body, as a quill or a piece of glass, and afterwards secured in a small vial. But when kept several days in a state of moisture, and during that time exposed to a warm temperature, I do not think it can be relied upon as capable of giving a perfect disease, although, as I have before observed, the progress of the symptoms arising from the action of the imperfect matter bear so strong a resemblance to the smallpox when excited completely.

Thirdly. That the first formed virus, or what constitutes the true cow-pox pustule, invariably possesses the power I have ascribed to it, namely, that of affecting the constitution with a specific disease, is a truth that no subsequent occurrence has yet led me to doubt. But as I am now endeavouring to guard the public as much as possible against erroneous conclusions, I shall observe that when this pustule has degenerated into an ulcer (to which state it is often disposed to pass unless timely checked), I suspect that matter possessing very different properties may sooner or later be produced; and although it may have passed that stage wherein the specific properties of the matter secreted are no longer present in it, yet when applied to a sore (as in the casual way) it might dispose that sore to ulcerate, and from its irritation the system would probably become affected; and thus, by assuming some of its strongest characters, it would imitate the genuine cow-pox.

From the preceding observations on the matter of smallpox when decomposed it must, I conceive, be admitted that cow-pox matter in the state now described may produce a disease, the effects of which may be felt both locally and generally, yet that the disease thus induced may not be effectual in obviating the future effects of variolous contagion. In the case of Mary Miller, related by Mr. Kite in the volume above alluded to, it appears that the inflammation and suppuration of the inoculated arm were more than usually severe, although the system underwent no specific change from the action of the virus; which appears from the patient's sickening seven weeks afterwards with the natural smallpox, which went through its course. Some of the cases communicated by Mr. Earle tend further to confirm this fact, as the matter there manifestly produced ulceration on the inoculated part to a considerable extent.

Fourthly. Whether the cow-pox is a spontaneous disease in the cow, or is to be attributed to matter conveyed to the animal, as I have conceived, from the horse, is a question which, though I shall not attempt now fully to discuss, yet I shall digress so far as to adduce some further observations, and to give my reasons more at large taking up an opinion that to some had appeared fanciful. The aggregate of these observations, though not amounting to positive proof, forms presumptive evidence of so forcible a kind that I imagine it might, on any other person, have made the same impression it did on me, without fixing the imputation of credulity.

Firstly: I conceived this was the source, from observing that where the cow-pox had appeared among the dairies here (unless it could be traced to the introduction of an infected cow or servant) it had been preceded at the farm by a horse diseased in the manner already described, which horse had been attended by some of the milkers.

Secondly: From its being a popular opinion throughout this great dairy country, and from its being insisted on by those who here attend sick cattle.

Thirdly: From the total absence of the disease in Ireland and Scotland, where the men-servants are not employed in the dairies.

Fourthly: From having observed that morbid matter generated by the horse frequently communicates, in a casual way, a disease to the human subject so like the cow-pox that, in many cases, it would be difficult to make the distinction between one and the other.

Fifthly: From being induced to suppose, from experiments, that some of those who had been thus affected from the horse resisted the smallpox.

Sixthly: From the progress and general appearance of the pustule on the arm of the boy whom I inoculated with matter taken from the hand of a man infected by a horse; and from the similarity to the cow-pox of general constitutional symptoms which followed.

I fear it would be trespassing too far to adduce the general testimony of our farmers in support of this opinion: yet I beg leave to introduce an extract of a letter on this subject from the Rev. Mr. Moore, of Chalford Hill, in this county:

> In the month of November, 1797, my horse had diseased heels, which was certainly what is termed the grease; and at a short subsequent period my cow was also affected with what a neighbouring farmer (who was conversant with the complaints of cattle) pronounced to be the cow-pox, which he at the same time observed my servant would be infected with: and this proved to be the case; for he had eruptions on his hands, face, and many parts of the body, the pustules appearing large, and not much like the smallpox, for which he had been inoculated a year and a half before, and had then a very heavy burthen. The pustules on the face might arise from contact with his hands, as he had a habit of rubbing his forehead, where the sores were the largest and the thickest.

The boy associated with the farmer's sons during the continuance of the disease, neither of whom had had the smallpox, but they felt no ill effects whatever. He was not much indisposed, as the disease did not prevent him from following his occupations as usual. No other person attended the horse or milked the cow but the lad above mentioned. I am firmly of opinion that the disease in the heels of the horse, which was a virulent grease, was the origin of the servant's and the cow's malady.

But to return to the more immediate object of this proposition.

From the similarity of symptoms, both constitutional and local, between the cow-pox and the disease received from morbid matter generated by a horse, the common people

in this neighbourhood, when infected with this disease, through a strange perversion of terms, frequently call it the cow-pox. Let us suppose, then, such a malady to appear among some of the servants at a farm, and at the same time that the cow-pox were to break out among the cattle; and let us suppose, too, that some of the servants were infected in this way, and that others received the infection from the cows. It would be recorded at the farm, and among the servants themselves wherever they might afterwards be dispersed, that they had all had the cow-pox. But it is clear that an individual thus infected from the horse would neither be for a certainty secure himself, nor would he impart security to others were they inoculated by virus thus generated. He still would be in danger of taking the smallpox. Yet were this to happen before the nature of the cowpox be more maturely considered by the public my evidence on the subject might be depreciated unjustly. For an exemplification of what is here advanced relative to the nature of the infection when received directly from the horse see Inquiry into the Causes and Effects of the Variolæ Vaccinæ, pp. 27, 28, 29, 30, and p. 35; and by way of further example, I beg leave to subjoin the following intelligence received from Mr. Fewster, Surgeon, of Thornbury, in this county, a gentleman perfectly well acquainted with the appearances of the cow-pox on the human subject:

> William Morris, aged thirty-two, servant to Mr. Cox of Almondsbury, in this county, applied to me the 2d of April, 1798. He told me that, four days before, he found a stiffness and swelling in both his hands, which were so painful it was with difficulty he continued his work; that he had been seized with pain in his head, small of the back, and limbs, and with frequent chilly fits succeeded by fever. On examination I found him still affected with these symptoms, and that there was a great prostration of strength. Many parts of his hands on the inside were chapped, and on the middle joint of the thumb of the right hand there was a small phagedenic ulcer, about the size of a large pea, discharging an ichorous fluid. On the middle finger of the same hand there was another ulcer of a similar kind. These sores were of a circular form, and he described their first appearance as being somewhat like blisters arising from a burn. He complained of excessive pain, which extended up his arm into the axilla. These symptoms and appearances of the sores were so exactly like the cow-pox that I pronounced he had taken the distemper from milking cows. He assured me he had not milked a cow for more than half a year, and that his master's cows had nothing the matter with them. I then asked him if his master had a greasy horse, which he answered in the affirmative, and further said that he had constantly dressed him twice a day for the last three weeks or more, and remarked that the smell of his hands was much like that of the horse's heels. On the 5th of April I again saw him, and found him still complaining of pain in both hands, nor were his febrile symptoms at all relieved. The ulcers had now spread to the size of a seven-shilling gold coin, and another ulcer, which I had not noticed before, appeared on the first

> joint of the forefinger of the left hand, equally painful with that on the right. I ordered him to bathe his hands in warm bran and water, applied escharotics to the ulcers, and wrapped his hands up in a soft cataplasm. The next day he was much relieved, and in something more than a fortnight got well. He lost his nails from the thumb and fingers that were ulcerated.

The sudden disappearance of the symptoms in this case after the application of the escharotics to the sores is worthy of observation; it seems to show that they were kept up by the irritation of the ulcers.

The general symptoms which I have already described of the cow-pox, when communicated in a casual way to any great extent, will, I am convinced, from the many cases I have seen, be found accurate; but from the very slight indisposition which ensues in cases of inoculation, where the pustule, after affecting the constitution, quickly runs into a scab spontaneously, or is artificially suppressed by some proper application, I am induced to believe that the violence of the symptoms may be ascribed to the inflammation and irritation of the ulcers (when ulceration takes place to any extent, as in the casual cow-pox), and that the constitutional symptoms which appear during the presence of the sore, while it assumes the character of a pustule only, are felt but in a very trifling degree. This mild affection of the system happens when the disease makes but a slight local impression on those who have been accidentally infected by cows; and, as far as I have seen, it has uniformly happened among those who have been inoculated, when a pustule only and no great degree of inflammation or any ulceration has taken place from the inoculation. The following cases will strengthen this opinion.

The cow-pox appeared at a farm in the village of Stonehouse, in this county, about Michaelmas last, and continued gradually to pass from one cow to another till the end of November. On the twenty-sixth of that month some ichorous matter was taken from a cow and dried upon a quill. On the 2d of December some of it was inserted into a scratch, made so superficial that no blood appeared, on the arms of Susan Phipps, a child seven years old. The common inflammatory appearances took place in consequence, and advanced till the fifth day, when they had so much subsided that I did not conceive anything further would ensue.

6th: Appearances stationary.

7th: The inflammation began to advance.

8th: A vesication, perceptible on the edges, forming, as in the inoculated smallpox, an appearance not unlike a grain of wheat, with the cleft, or indentation in the centre.

9th: Pain in the axilla.

10th: A little headache; pulse, 110; tongue not discoloured; countenance in health.

11th, 12th: No perceptible illness; pulse about 100.

13th: The pustule was now surrounded by an efflorescence, interspersed with very minute confluent pustules to the extent of about an inch. Some of these pustules advanced in size and maturated. So exact was the resemblance of the arm at this stage to the general appearance of the inoculated smallpox that Mr. D., a neighbouring surgeon, who took some matter from it, and who had never seen the cow-pox before, declared he could not perceive any difference. The child's arm now shewed a disposition to scab, and remained nearly stationary for two or three days, when it began to run into an ulcerous state, and then commenced a febrile indisposition accompanied with an increase of axillary tumour. The ulcer continued spreading near a week, during which time the child continued ill, when it increased to a size nearly as large as a shilling. It began now to discharge pus; granulations sprang up, and it healed. This child had before been of a remarkably sickly constitution, but is now in very high health.

Mary Hearn, twelve years of age, was inoculated with matter taken from the arm of Susan Phipps.

6th day: A pustule beginning to appear, slight pain in the axilla.

7th: A distinct vesicle formed.

8th: The vesicle increasing; edges very red; no deviation in its appearance at this time from the inoculated smallpox.

9th: No indisposition; pustule advancing.

10th: The patient felt this evening a slight febrile attack.

11th: Free from indisposition.

12th, 13th: The same.

14th: An efflorescence of a faint red colour extending several inches round the arm. The pustule, beginning to shew a disposition to spread, was dressed with an ointment composed of hydrarg. nit. rub. and ung. cerœ. The efflorescence itself was covered with a plaster of ung. hydr. fort. In six hours it was examined, when it was found that the efflorescence had totally disappeared.

The application of the ointment with the hydr. nit. rub. was made use of for three days, when, the state of the pustule remaining stationary, it was exchanged for the ung. hydr. nit. This appeared to have a more active effect than the former, and in two or three days the virus seemed to be subdued, when a simple dressing was made use of; but the sore again shewing a disposition to inflame, the ung. hydr. nit. was again applied, and

soon answered the intended purpose effectually. The girl, after the tenth day, when, as has been observed, she became a little ill, shewed not the least symptom of indisposition. She was afterwards exposed to the action of variolous matter, and completely resisted it. Susan Phipps also went through a similar trial. Conceiving these cases to be important, I have given them in detail: first, to urge the precaution of using such means as may stop the progress of the pustule; and, secondly, to point out (what appears to be the fact) that the most material indisposition, or at least that which is felt most sensibly, does not arise primarily from the first action of the virus on the constitution, but that it often comes on, if the pustule is left to chance, as a secondary disease. This leads me to conjecture, what experiment must finally determine, that they who have had the smallpox are not afterwards susceptible of the primary action of the cow-pox virus; for seeing that the simple virus itself, when it has not passed beyond the boundary of a vesicle, excites in the system so little commotion, is it not probable the trifling illness thus induced may be lost in that which so quickly, and oftentimes so severely, follows in the casual cow-pox from the presence of corroding ulcers? This consideration induces me to suppose that I may have been mistaken in my former observation on this subject.

In this respect, as well as many others, a parallel may be drawn between this disease and the smallpox. In the latter, the patient first feels the effect of what is called the absorption of the virus. The symptoms then often nearly retire, when a fresh attack commences, different from the first, and the illness keeps pace with the progress of the pustules through their different stages of maturation, ulceration, etc.

Although the application I have mentioned in the case of Mary Hearn proved sufficient to check the progress of ulceration and prevent any secondary symptoms, yet, after the pustule has duly exerted its influence, I should prefer the destroying it quickly and effectually to any other mode. The term caustic to a tender ear (and I conceive none feel more interested in this inquiry than the anxious guardians of a nursery) may sound harsh and unpleasing, but every solicitude that may arise on this account will no longer exist when it is understood that the pustule, in a state fit to be acted upon, is then quite superficial, and that it does not occupy the space of a silver penny.

As a proof of the efficacy of this practice, even before the virus has fully exerted itself on the system, I shall lay before my reader the following history:

> By a reference to the treatise on the Variolæ Vaccinæ it will be seen that, in the month of April, 1798, four children were inoculated with the matter of cow-pox, and that in two of these cases the virus on the arm was destroyed soon after it had produced a perceptible sickening. Mary James, aged seven years, one of the children alluded to, was inoculated in the month of December following with fresh variolous matter, and at the same time was exposed to the effluvia of a patient affected with the smallpox. The appearance and progress of the infected arm was, in every respect, similar to that which we generally observe when variolous matter has been inserted into the skin of a person who has not previously undergone either the cow-pox or the

> smallpox. On the eighth day, conceiving there was infection in it, she was removed from her residence among those who had not had the smallpox. I was now anxiously waiting the result, conceiving, from the state of the girl's arm, she would fall sick about this time. On visiting her on the evening of the following day (the ninth) all I could learn from the woman who attended her was that she felt somewhat hotter than usual during the night, but was not restless; and that in the morning there was the faint appearance of a rash about her wrists. This went off in a few hours, and was not at all perceptible to me on my visit in the evening. Not a single eruption appeared, the skin having been repeatedly and carefully examined. The inoculated arm continued to make the usual progress to the end, through all the stages of inflammation, maturation, and scabbing.

On the eighth day matter was taken from the arm of this girl (Mary James) and inserted into the arms of her mother and brother (neither of whom had had either the smallpox or the cow-pox), the former about fifty years of age, the latter six.

On the eighth day after the insertion the boy felt indisposed, and continued unwell two days, when a measles-like rash appeared on his hands and wrists, and was thinly scattered over his arms. The day following his body was marbled over with an appearance somewhat similar, but he did not complain, nor did he appear indisposed. A few pustules now appeared, the greater part of which went away without maturating.

On the ninth day the mother began to complain. She was a little chilly and had a headache for two days, but no pustule appeared on the skin, nor had she any appearance of a rash.

The family was attended by an elderly woman as a nurse, who in her infancy had been exposed to the contagion of the smallpox, but had resisted it. This woman was now infected, but had the disease in the slightest manner, a very few eruptions appearing, two or three of which only maturated.

From a solitary instance like that adduced of Mary James, whose constitution appears to have resisted the action of the variolous virus, after the influence of the cow-pox virus had been so soon arrested in its progress, no positive conclusion can be fairly drawn; nor from the history of the three other patients who were subsequently infected, but, nevertheless, the facts collectively may be deemed interesting.

That one mild variety of the smallpox has appeared I have already plainly shewn; and by the means now mentioned we probably have it in our power to produce at will another.

At the time when the pustule was destroyed in the arm of Mary James I was informed she had been indisposed about twelve hours; but I am now assured by those who were with her that the space of time was much less. Be that as it may, in cases of cow-pox inoculation I would not recommend any application to subdue the action of the pustule until convincing proofs had appeared of the patient's having felt its effects at least twelve hours. No harm, indeed, could ensue were a longer period to elapse before

the application was made use of. In short, it should be suffered to have as full an effect as it could, consistently with the state of the arm.

As the cases of inoculation multiply, I am more and more convinced of the extreme mildness of the symptoms arising merely from the primary action of the virus on the constitution, and that those symptoms which, as in the accidental cow-pox, affect the patient with severity, are entirely secondary, excited by the irritating processes of inflammation and ulceration; and it appears to me that this singular virus possesses an irritating quality of a peculiar kind, but as a single cow-pox pustule is all that is necessary to render the variolous virus ineffectual, and as we possess the means of allaying the irritation, should any arise, it becomes of little or no consequence.

It appears then, as far as an inference can be drawn from the present progress of cow-pox inoculation, that it is an accidental circumstance only which can render this a violent disease, and a circumstance of that nature which, fortunately, it is in the power of almost every one to avoid. I allude to the communication of the disease from cows. In this case, should the hands of the milker be affected with little accidental sores to any extent, every sore would become the nidus of infection and feel the influence of the virus; and the degree of violence in the constitutional symptoms would be in proportion to the number and to the state of these local affections. Hence it follows that a person, either by accident or design, might be so filled with these wounds from contact with the virus that the constitution might sink under the pressure.

Seeing that we possess the means of rendering the action of the sores mild, which, when left to chance, are capable of producing violent effects; and seeing, too, that these sores bear a resemblance to the smallpox, especially the confluent, should it not encourage the hope that some topical application might be used with advantage to counteract the fatal tendency of that disease, when it appears in this terrific form? At what stage or stages of the disease this may be done with the most promising expectation of success I will not pretend now to determine. I only throw out this idea as the basis of further reasoning and experiment.

I have often been foiled in my endeavours to communicate the cow-pox by inoculation. An inflammation will sometimes succeed the scratch or puncture, and in a few days disappear without producing any further effect. Sometimes it will even produce an ichorous fluid, and yet the system will not be affected. The same thing, we know, happens with the smallpox virus.

Four or five servants were inoculated at a farm contiguous to this place, last summer, with matter just taken from an infected cow. A little inflammation appeared on all their arms, but died away without producing a pustule; yet all these servants caught the disease within a month afterwards from milking the infected cows, and some of them had it severely. At present no other mode than that commonly practiced for inoculating the smallpox has been used for giving the cow-pox; but it is probable this might be varied with advantage. We should imitate the casual communication more clearly were we first, by making the smallest superficial incision or puncture on the skin, to produce a little scab, and then, removing it, to touch the abraded part with the virus. A small portion

of a thread imbrued in the virus (as in the old method of inoculating the smallpox) and laid upon the slightly incised skin might probably prove a successful way of giving the disease; or the cutis might be exposed in a minute point by an atom of blistering plaster, and the virus brought in contact with it. In the cases just alluded to, where I did not succeed in giving the disease constitutionally, the experiment was made with matter taken in a purulent state from a pustule on the nipple of a cow.

Is pure pus, though contained in a smallpox pustule, ever capable of producing the smallpox perfectly? I suspect it is not. Let us consider that it is always preceded by the limpid fluid, which, in constitutions susceptible of variolous contagion, is always infectious; and though, on opening a pustule, its contents may appear perfectly purulent, yet a given quantity of the limpid fluid may, at the same time, be blended with it, though it would be imperceptible to the only test of our senses, the eye. The presence, then, of this fluid, or its mechanical diffusion through pus, may at all times render active what is apparently mere pus, while its total absence (as in stale pustules) may be attended with the imperfect effects we have seen.

It would be digressing too widely to go far into the doctrine of secretion, but as it will not be quite extraneous, I shall just observe that I consider both the pus and the limpid fluid of the pustule as secretions, but that the organs established by nature to perform the office of secreting these fluids may differ essentially in their mechanical structure. What but a difference in the organization of glandular bodies constitutes the difference in the qualities of the fluids secreted? From some peculiar derangement in the structure or, in other words, some deviation in the natural action of a gland destined to create a mild, innoxious fluid, a poison of the most deadly nature may be created. For example: That gland, which in its sound state secretes pure saliva, may, from being thrown into diseased action, produce a poison of the most destructive quality. Nature appears to have no more difficulty in forming minute glands among the vascular parts of the body than she has in forming blood vessels, and millions of these can be called into existence, when inflammation is excited, in a few hours.

In the present early stage of the inquiry (for early it certainly must be deemed), before we know for an absolute certainty how soon the virus of the cow-pox may suffer a change in its specific properties, after it has quitted the limpid state it possesses when forming a pustule, it would be prudent for those who have been inoculated with it to submit to variolous inoculation. No injury or inconvenience can accrue from this; and were the same method practiced among those who, from inoculation, have felt the smallpox in an unsatisfactory manner at any period of their lives, it might appear that I had not been too officious in offering a cautionary hint in recommending a second inoculation with matter in its most perfect state.

And here let me suppose, for argument's sake (not from conviction), that one person in an hundred after having had the cow-pox should be found susceptible of the smallpox, would this invalidate the utility of the practice? For, waiving all other considerations, who will deny that the inoculated smallpox, although abstractedly it may be considered as harmless, does not involve in itself something that in numberless instances proves baneful to the human frame.

That in delicate constitutions it sometimes excites scrofula is a fact that must generally be subscribed to, as it is so obvious to common observation. This consideration is important.

As the effects of the smallpox inoculation on those who have had the cow-pox will be watched with the most scrupulous eye by those who prosecute this inquiry, it may be proper to bring to their recollection some facts relative to the smallpox, which I must consider here as of consequence, but which hitherto seem not to have made a due impression.

It should be remembered that the constitution cannot, by previous infection, be rendered totally unsusceptible of the variolous poison; neither the casual nor the inoculated smallpox, whether it produces the disease in a mild or in a violent way, can perfectly extinguish the susceptibility. The skin, we know, is ever ready to exhibit, though often in a very limited degree, the effects of the poison when inserted there; and how frequently do we see, among nurses, when much exposed to the contagion, eruptions, and these sometimes preceded by sensible illness! Yet should any thing like an eruption appear, or the smallest degree of indisposition, upon the insertion of the variolous matter on those who have gone through the cow-pox, my assertions respecting the peculiarities of the disease might be unjustly discredited.

I know a gentleman who, many years ago, was inoculated for the smallpox, but having no pustules, or scarcely any constitutional affection that was perceptible, he was dissatisfied, and has since been repeatedly inoculated. A vesicle has always been produced in the arm in consequence, with axillary swelling and a slight indisposition; this is by no means a rare occurrence. It is probable that fluid thus excited upon the skin would always produce the smallpox.

On the arm of a person who had gone through the cow-pox many years before I once produced a vesication by the insertion of variolous matter, and, with a little of the fluid, inoculated a young woman who had a mild, but very efficacious, smallpox in consequence, although no constitutional effect was produced on the patient from whom the matter was taken. The following communication from Mr. Fewster affords a still clearer elucidation of this fact. Mr. Fewster says: On the 3d of April, 1797, I inoculated Master H, aged fourteen months, for the smallpox. At the usual time he sickened, had a plentiful eruption, particularly on his face, and got well. His nursemaid, aged twenty-four, had many years before gone through the smallpox, in the natural way, which was evident from her being much pitted with it. She had used the child to sleep on her left arm, with her left cheek in contact with his face, and during his inoculation he had mostly slept in that manner. About a week after the child got well she (the nurse) desired me to look at her face, which she said was very painful. There was a plentiful eruption on the left cheek, but not on any other part of the body, which went on to maturation.

On enquiry I found that three days before the appearance of the eruption she was taken with slight chilly fits, pain in her head and limbs, and some fever. On the appearance of the eruption these pains went off, and now, the second day of the eruption, she complains of a little sore throat. Whether the above symptoms are the effects of

the smallpox or a recent cold I do not know. On the fifth day of the eruption I charged a lancet from two of the pustules, and on the next day I inoculated two children, one two years, the other four months old, with the matter. At the same time I inoculated the mother and eldest sister with variolous matter taken from Master H. On the fifth day of their inoculation all their arms were inflamed alike; and on the eighth day the eldest of those inoculated from the nurse sickened, and the youngest on the eleventh. They had both a plentiful eruption, from which I inoculated several others, who had the disease very favourably. The mother and the other child sickened about the same time, and likewise had a plentiful eruption.

Soon after, a man in the village sickened with the smallpox and had a confluent kind. To be convinced that the children had had the disease effectually I took them to his house and inoculated them in both arms with matter taken from him, but without effect.

These are not brought forward as uncommon occurrences, but as exemplifications of the human system's susceptibility of the variolous contagion, although it has been previously sensible of its action.

Happy is it for mankind that the appearance of the smallpox a second time on the same person, beyond a trivial extent, is so extremely rare that it is looked upon as a phænomenon! Indeed, since the publication of Dr. Heberden's paper on the Varicellæ, or chickenpox, the idea of such an occurrence, in deference to authority so truly respectable, has been generally relinquished. This I conceive has been without just reason; for after we have seen, among many others, so strong a case as that recorded by Mr. Edward Withers, Surgeon, of Newbury, Berks, in the fourth volume of the Memoirs of the Medical Society of London (from which I take the following extracts), no one, I think, will again doubt the fact:

> Mr. Richard Langford, a farmer of West Shefford, in this county (Berks), about fifty years of age, when about a month old had the smallpox at a time when three others of the family had the same disease, one of whom, a servant man, died of it. Mr. Langford's countenance was strongly indicative of the malignity of the distemper, his face being so remarkably pitted and seamed as to attract the notice of all who saw him, so that no one could entertain a doubt of his having had that disease in a most inveterate manner.

Mr. Withers proceeds to state that Mr. Langford was seized a second time, had a bad confluent smallpox, and died on the twenty-first day from the seizure; and that four of the family, as also a sister of the patient's, to whom the disease was conveyed by her son's visiting his uncle, falling down with the smallpox, fully satisfied the country with regard to the nature of the disease, which nothing short of this would have done. The sister died.

This case was thought so extraordinary a one as to induce the rector of the parish to record the particulars in the parish register.

It is singular that in most cases of this kind the disease in the first instance has been confluent; so that the extent of the ulceration on the skin (as in the cow-pox) is not the process in nature which affords security to the constitution.

As the subject of the smallpox is so interwoven with that which is the more immediate object of my present concern, it must plead my excuse for so often introducing it. At present it must be considered as a distemper not well understood. The inquiry I have instituted into the nature of the cow-pox will probably promote its more perfect investigation.

The inquiry of Dr. Pearson into the history of the cow-pox having produced so great a number of attestations in favour of my assertion that it proves a protection to the human body from the smallpox, I have not been assiduous in seeking for more; but as some of my friends have been so good as to communicate the following, I shall conclude these observations with their insertion.

Extract of a letter from Mr. Drake, Surgeon, at Stroud, in this county, and late Surgeon to the North Gloucester Regiment of Militia:

> In the spring of the year 1796 I inoculated men, women, and children to the amount of about seventy. Many of the men did not receive the infection, although inoculated at least three times and kept in the same room with those who actually underwent the disease during the whole time occupied by them in passing through it. Being anxious they should, in future, be secure against it, I was very particular in my inquiries to find out whether they ever had previously had it, or at any time been in the neighbourhood of people labouring under it. But, after all, the only satisfactory information I could obtain was that they had had the cow-pox. As I was then ignorant of such a disease affecting the human subject, I flattered myself what they imagined to be the cow-pox was in reality the smallpox in a very slight degree. I mentioned the circumstance in the presence of the officers, at the time expressing my doubts if it were not smallpox, and was not a little surprised when I was told by the Colonel that he had frequently heard you mention the cow-pox as a disease endemial to Gloucestershire, and that if a person were ever affected by it, you supposed him afterwards secure from the smallpox. This excited my curiosity, and when I visited Gloucestershire I was very inquisitive concerning the subject, and from the information I have since received, both from your publication and from conversation with medical men of the greatest accuracy in their observations, I am fully convinced that what the men supposed to be cow-pox was actually so, and I can safely affirm that they effectually resisted the smallpox.

Mr. Fry, Surgeon, at Dursley in this county, favours me with the following communication:

> During the spring of the year 1797 I inoculated fourteen hundred and seventy-five patients, of all ages, from a fortnight old to seventy years; amongst whom there were many who had previously gone through the cow-pox. The exact number I cannot state; but if I say there were nearly thirty, I am certainly within the number. There was not a single instance of the variolous matter producing any constitutional effect on these people, nor any greater degree of local inflammation than it would have done in the arm of a person who had before gone through the smallpox, notwithstanding it was invariably inserted four, five, and sometimes six different times, to satisfy the minds of the patients. In the common course of inoculation previous to the general one scarcely a year passed without my meeting with one or two instances of persons who had gone through the cow-pox, resisting the action of the variolous contagion. I may fairly say that the number of people I have seen inoculated with the smallpox who, at former periods, had gone through the cow-pox, are not less than forty; and in no one instance have I known a patient receive the smallpox, notwithstanding they invariably continued to associate with other inoculated patients during the progress of the disease, and many of them purposely exposed themselves to the contagion of the natural smallpox; whence I am fully convinced that a person who had fairly had the cow-pox is no longer capable of being acted upon by the variolous matter.

I also inoculated a very considerable number of those who had had a disease which ran through the neighbourhood a few years ago, and was called by the common people the swine-pox, not one of whom received the smallpox.

There were about half a dozen instances of people who never had either the cow- or swine-pox, yet did not receive the smallpox, the system not being in the least deranged, or the arms inflamed, although they were repeatedly inoculated, and associated with others who were labouring under the disease; one of them was the son of a farrier.

Mr. Tierny, Assistant Surgeon of the South Gloucester Regiment of Militia, has obliged me with the following information:

> That in the summer of the year of 1798 he inoculated a great number of the men belonging to the regiment, and that among them he found eleven who, from having lived in dairies, had gone through the cow-pox. That all of them resisted the smallpox except one, but that on making the most rigid and scrupulous enquiry at the farm in Gloucestershire, where the man said he lived when he had the disease, and among those with whom, at the same time, he declared he had associated, and particularly of a person in the parish, whom he said had dressed his fingers, it most clearly appeared that he aimed at an imposition, and that he never had been affected with the cow-pox.

Mr. Tierny remarks that the arms of many who were inoculated after having had the cow-pox inflamed very quickly, and that in several a little ichorous fluid was formed.

Mr. Cline, who in July last was so obliging at my request as to try the efficacy of the cow-pox virus, was kind enough to give me a letter on the result of it, from which the following is an extract:

A Continuation of Facts and Observations Relative to the Variolæ Vaccinæ, or Cow-Pox Part III. 1800

Edward Jenner, FRS

SINCE my former publications on the vaccine inoculation I have had the satisfaction of seeing it extend very widely. Not only in this country is the subject pursued with ardour, but from my correspondence with many respectable medical gentlemen on the Continent (among whom are Dr. De Carro, of Vienna, and Dr. Ballhorn, of Hanover) I find it is as warmly adopted abroad, where it has afforded the greatest satisfaction. I have the pleasure, too, of seeing that the feeble efforts of a few individuals to depreciate the new practice are sinking fast into contempt beneath the immense mass of evidence which has arisen up in support of it.

Upwards of six thousand persons have now been inoculated with the virus of cow-pox, and the far greater part of them have since been inoculated with that of smallpox, and exposed to its infection in every rational way that could be devised, without effect.

It was very improbable that the investigation of a disease so analogous to the smallpox should go forward without engaging the attention of the physician of the Smallpox Hospital in London.

Accordingly, Dr. Woodville, who fills that department with so much respectability, took an early opportunity of instituting an inquiry into the nature of the cow-pox. This inquiry was begun in the early part of the present year, and in May, Dr. Woodville published the result, which differs essentially from mine in a point of much importance. It appears that three-fifths of the patients inoculated were affected with eruptions, for the most part so perfectly resembling the smallpox as not to be distinguished from them. On this subject it is necessary that I should make some comments.

When I consider that out of the great number of cases of casual inoculation immediately from cows which from time to time presented themselves to my observation, and the many similar instances which have been communicated to me by medical gentlemen in this neighbourhood; when I consider, too, that the matter with which my inoculations were conducted in the years 1797, 1798, and 1799, was taken from some different cows, and that in no instance any thing like a variolous pustule appeared, I cannot feel disposed to imagine that eruptions, similar to those described by Dr. Woodville, have ever been produced by the *pure uncontaminated cow-pox virus;* on the contrary, I do suppose that those which the doctor speaks of originated in the action of variolous matter which crept into the constitution with the vaccine. And

this I presume happened from the inoculation of a great number of the patients with variolous matter (some on the third, others on the fifth, day) after the vaccine had been applied; and it should be observed that the matter thus propagated became the source of future inoculations in the hands of many medical gentlemen who appeared to have been previously unacquainted with the nature of the cow-pox.

Another circumstance strongly, in my opinion, supporting this supposition is the following: The cow-pox has been known among our dairies time immemorial. If pustules, then, like the variolous, were to follow the communication of it from the cow to the milker, would not such a fact have been known and recorded at our farms? Yet neither our farmers nor the medical people of the neighbourhood have noticed such an occurrence.

The change which took place in the general appearance during the progress of the vaccine inoculation at the Smallpox Hospital should likewise be considered.

Although at first it took on so much of the variolous character as to produce pustules in three cases out of five, yet in Dr. Woodville's last report, published in June, he says: Since the publication of my reports of inoculations for the cow-pox, upwards of three hundred cases have been under my care; and out of this number only thirty-nine had pustules that suppurated; viz., out of the first hundred, nineteen had pustules; out of the second, thirteen; and out of the last hundred and ten, only seven had pustules. Thus it appears that the disease has become considerably milder; which I am inclined to attribute to a greater caution used in the choice of the matter, with which the infection was communicated; for, lately, that which has been employed for this purpose has been taken only from those patients in whom the cow-pox proved very mild and well characterized.

The inference I am induced to draw from these premises is very different. The decline, and, finally, the total extinction nearly, of these pustules, in my opinion, are more fairly attributable to the cowpox virus, assimilating the variolous, the former probably being the original, the latter the same disease under a peculiar, and at present an inexplicable, modification.

One experiment tending to elucidate the point under discussion I had myself an opportunity of instituting. On the supposition of its being possible that the cow which ranges over the fertile meadows in the vale of Gloucester might generate a virus differing in some respects in its qualities from that produced by the animal artificially pampered for the production of milk for the metropolis, I procured, during my residence there in the spring, some cow-pox virus from a cow at one of the London milk-farms. It was immediately conveyed into Gloucestershire to Dr. Marshall, who was then extensively engaged in the inoculation of the cow-pox, the general result of which, and of the inoculation in particular with this matter, I shall lay before my reader in the following communication from the doctor:

> DEAR SIR:
>
> My neighbour, Mr. Hicks, having mentioned your wish to be informed of the progress of the inoculation here for the cow-pox, and he also having taken the

trouble to transmit to you my minutes of the cases which have fallen under my care, I hope you will pardon the further trouble I now give you in stating the observations I have made upon the subject. When first informed of it, having two children who had not had the smallpox, I determined to inoculate them for the cow-pox whenever I should be so fortunate as to procure matter proper for the purpose. I was, therefore, particularly happy when I was informed that I could procure matter from some of those whom you had inoculated. In the first instance I had no intention of extending the disease further than my own family, but the very extensive influence which the conviction of its efficacy in resisting the smallpox has had upon the minds of the people in general has rendered that intention nugatory, as you will perceive, by the continuation of my cases enclosed in this letter, by which it will appear that since the 22d of March I have inoculated an hundred and seven persons; which, considering the retired situation I resided in, is a very great number. There are also other considerations which, besides that of its influence in resisting the smallpox, appear to have had their weight; the peculiar mildness of the disease, the known safety of it, and its not having in any instance prevented the patient from following his ordinary business. In all the cases under my care there have only occurred two or three which required any application, owing to erysipelatous inflammation on the arm, and they immediately yielded to it. In the remainder the constitutional illness has been slight but sufficiently marked, and considerably less than I ever observed in the same number inoculated with the smallpox. In only one or two of the cases have any other eruptions appeared than those around the spot where the matter was inserted, and those near the infected part. Neither does there appear in the cow-pox to be the least exciting cause to any other disease, which in the smallpox has been frequently observed, the constitution remaining in as full health and vigour after the termination of the disease as before the infection. Another important consideration appears to be the impossibility of the disease being communicated except by the actual contact of the matter of the pustule, and consequently the perfect safety of the remaining part of the family, supposing only one or two should wish to be inoculated at the same time.

Upon the whole, it appears evident to me that the cow-pox is a pleasanter, shorter, and infinitely more safe disease than the inoculated smallpox when conducted in the most careful and approved manner; neither is the local affection of the inoculated part, or the constitutional illness, near so violent. I speak with confidence on the subject, having had an opportunity of observing its effects upon a variety of constitutions, from three months old to sixty years; and to which I have paid particular attention. In the cases alluded to here you will observe that the removal from the original source of the matter had made no alteration or change in the nature or appearance of the disease, and that it may be continued, *ad infinitum* (I imagine), from one person to

another (if care be observed in taking the matter at a proper period) without any necessity of recurring to the original matter of the cow.

I should be happy if any endeavours of mine could tend further to elucidate the subject, and shall be much gratified in sending you any further observations I may be enabled to make.

I have the pleasure to subscribe myself,
Dear sir, etc.,
JOSEPH H. MARSHALL.
EASTINGTON, GLOUCESTERSHIRE, April 26, 1799.

The gentleman who favoured me with the above account has continued to prosecute his inquiries with unremitting industry, and has communicated the result in another letter, which at his request I lay before the public without abbreviation.

Dr. Marshall's second letter:

DEAR SIR:

Since the date of my former letter I have continued to inoculate with the cow-pox virus. Including the cases before enumerated, the number now amounts to four hundred and twenty-three. It would be tedious and useless to detail the progress of the disease in each individual, it is sufficient to observe that I noticed no deviation in any respect from the cases I formerly adduced. The general appearances of the arm exactly corresponded with the account given in your first publication. When they were disposed to become troublesome by erysipelatous inflammation, an application of equal parts of vinegar and water always answered the desired intention. I must not omit to inform you that when the disease had duly acted upon the constitution I have frequently used the vitriolic acid. A portion of a drop applied with the head of a probe or any convenient utensil upon the pustule, suffered to remain about forty seconds, and afterwards washed off with sponge and water, never failed to stop its progress and expedite the formation of a scab.

I have already subjected two hundred and eleven of my patients to the action of variolous matter, *but every one resisted it.*

The result of my experiments (which were made with every requisite caution) has fully convinced me that the *true cow-pox* is a safe and infallible preventive from the smallpox; that in no case which has fallen under my observation has it been in any considerable degree troublesome, much less have I seen any thing like danger; for in no instance were the patients prevented from following their ordinary employments.

In Dr. Woodville's publication on the cow-pox I notice an extraordinary fact. He says that the generality of his patients had pustules. It certainly appears extremely extraordinary that in all my cases there never was but

one pustule, which appeared on a patient's elbow on the inoculated arm, and maturated. It appeared exactly like that on the incised part.

The whole of my observations, founded as it appears on an extensive experience, leads me to these obvious conclusions; that those cases which have been or may be adduced against the preventive powers of the cow-pox could not have been those of the true kind, since it must appear to be absolutely impossible that I should have succeeded in such a number of cases without a single exception if such a preventive power did not exist. I cannot entertain a doubt that the inoculated cow-pox must quickly supersede that of the smallpox. If the many important advantages which must result from the new practice are duly considered, we may reasonably infer that public benefit, the sure test of the real merit of discoveries, will render it generally extensive.

To you, Sir, as the discoverer of this highly beneficial practice, mankind are under the highest obligations. As a private individual I participate in the general feeling; more particularly as you have afforded me an opportunity of noticing the effects of a singular disease, and of viewing the progress of the most curious experiment that ever was recorded in the history of physiology.

I remain, dear sir, etc.,
JOSEPH H. MARSHALL.

P.S. I should have observed that, of the patients I inoculated and enumerated in my letter, one hundred and twenty-seven were infected with the matter you sent me from the London cow. I discovered no dissimilarity of symptoms in these cases from those which I inoculated from matter procured in this country. No pustules have occurred, except in one or two cases, where a single one appeared on the inoculated arm. No difference was apparent in the local inflammation. There was no suspension of ordinary employment among the labouring people, nor was any medicine required.

I have frequently inoculated one or two in a family, and the remaining part of it some weeks afterwards. The uninfected have slept with the infected during the whole course of the disease without being affected; so that I am fully convinced that the disease cannot be taken but by actual contact with the matter.

A curious fact has lately fallen under my observation, on which I leave you to comment.

I visited a patient with the confluent smallpox and charged a lancet with some of the matter. Two days afterwards I was desired to inoculate a woman and four children with the cow-pox, and I inadvertently took the vaccine matter on the same lancet which was before charged with that of smallpox. In three days I discovered the mistake, and fully expected that my five patients would be infected with smallpox; but I was agreeably

surprised to find the disease to be genuine cow-pox, which proceeded without deviating in any particular from my former cases. I afterwards inoculated these patients with variolous matter, but all of them resisted its action.

I omitted mentioning another great advantage that now occurs to me in the inoculated cow-pox; I mean the safety with which pregnant women may have the disease communicated to them. I have inoculated a great number of females in that situation, and never observed their cases to differ in any respect from those of my other patients. Indeed, the disease is so mild that it seems as if it might at all times be communicated with the most perfect safety.

I shall here take the opportunity of thanking Dr. Marshall and those other gentlemen who have obligingly presented me with the result of their inoculations; but, as they all agree in the same point as that given in the above communication, namely, the security of the patient from the effects of the smallpox after the cow-pox, their perusal, I presume, would afford us no satisfaction that has not been amply given already. Particular occurrences I shall, of course, detail. Some of my correspondents have mentioned the appearance of smallpox-like eruptions at the commencement of their inoculations; but in these cases the matter was derived from the original stock at the Smallpox Hospital.

I have myself inoculated a very considerable number from the matter produced by Dr. Marshall's patients, originating in the London cow, without observing pustules of any kind, and have dispersed it among others who have used it with a similar effect. From this source Mr. H. Jenner informs me he has inoculated above an hundred patients without observing eruptions. Whether the nature of the virus will undergo any change from being farther removed from its original source in passing successively from one person to another time alone can determine. That which I am now employing has been in use near eight months, and not the least change is perceptible in its mode of action either locally or constitutionally. There is, therefore, every reason to expect that its effects will remain unaltered and that we shall not be under the necessity of seeking fresh supplies from the cow.

The following observations were obligingly sent me by Mr. Tierny, Assistant Surgeon to the South Gloucester Regiment of Militia, to whom I am indebted for a former report on this subject:

> I inoculated with the cow-pox matter from the eleventh to the latter part of April, twenty-five persons, including women and children. Some on the eleventh were inoculated with the matter Mr.Shrapnell (surgeon to the regiment) had from you, the others with matter taken from these. The progress of the puncture was accurately observed, and its appearance seemed to differ from the smallpox in having less inflammation around its basis on the first days, that is, from the third to the seventh; but after this the inflammation increased, extending on the tenth or eleventh day to a circle of an inch and a half from its centre, and threatening very sore arms; but this I am happy to say was not the case; for, by applying mercurial ointment to the inflamed part,

> which was repeated daily until the inflammation went off, the arm got well without any further application or trouble. The constitutional symptoms which appeared on the eighth or ninth day after inoculation scarcely deserved the name of disease, as they were so slight as to be scarcely perceptible, except that I could connect a slight headache and languor, with a stiffness and rather painful sensation in the axilla. This latter symptom was the most striking, it remained from twelve to forty-eight hours. In no case did I observe the smallest pustule, or even discolouration of the skin, like an incipient pustule, except about the part where the virus has been applied.
>
> After all these symptoms had subsided and the arms were well, I inoculated four of this number with variolous matter, taken from a patient in another regiment. In each of these it was inserted several times under the cuticle, producing slight inflammation on the second or third day, and always disappearing before the fifth or sixth, except in one who had the cow-pox in Gloucestershire before he joined us, and who also received it at this time by inoculation. In this man the puncture inflamed and his arm was much sorer than from the insertion of the cow-pox virus; but there was no pain in the axilla, nor could any constitutional affection be observed.
>
> Although the susceptibility of the virus of the cow-pox is, for the most part, lost in those who have had the smallpox, yet in some constitutions it is only partially destroyed, and in others it does not appear to be in the least diminished.
>
> I have only to add that I am now fully satisfied of the efficacy of the cow-pox in preventing the appearance of the smallpox, and that it is a most happy and salutary substitute for it.
>
> I remain, etc.,
> M. J. TIERNY.

Although the susceptibility of the virus of the cow-pox is, for the most part, lost in those who have had the smallpox, yet in some constitutions it is only partially destroyed, and in others it does not appear to be in the least diminished.

By far the greater number on whom trials were made resisted it entirely; yet I found some on whose arm the pustule from inoculation was formed completely, but without producing the common efflorescent blush around it, or any constitutional illness, while others have had the disease in the most perfect manner. A case of the latter kind having been presented to me by Mr. Fewster, Surgeon, of Thornbury, I shall insert it:

> Three children were inoculated with the vaccine matter you obligingly sent me. On calling to look at their arms three days after I was told that John Hodges, one of the three, had been inoculated with the smallpox when a year old, and that he had a full burthen, of which his face produced plentiful marks, a circumstance I was not before made acquainted with. On the sixth

> day the arm of the boy appeared as if inoculated with variolous matter, but the pustule was rather more elevated. On the ninth day he complained of violent pain in his head and back, accompanied with vomiting and much fever. The next day he was very well and went to work as usual. The punctured part began to spread, and there was the areola around the inoculated part to a considerable extent.
>
> As this is contrary to an assertion made in the Medical and Physical Journal, No. 8, I thought it right to give you this information, and remain,
>
> Dear sir, etc.,
>
> J. FEWSTER.

It appears, then, that the animal economy with regard to the action of this virus is under the same laws as it is with respect to the variolous virus, after previously feeling its influence, as far as comparisons can be made between the two diseases.

Some striking instances of the power of the cow-pox in suspending the progress of the smallpox after the patients had been several days casually exposed to the infection have been laid before me by Mr. Lyford, Surgeon, of Winchester, and my nephew, the Rev. G. C. Jenner. Mr. Lyford, after giving an account of his extensive and successful practice in the vaccine inoculation in Hampshire, writes as follows:

> The following case occurred to me a short time since, and may probably be worth your notice. I was sent for to a patient with the smallpox, and on inquiry found that five days previous to my seeing him the eruption began to appear. During the whole of this time two children who had not had the smallpox, were constantly in the room with their father, and frequently on the bed with him. The mother consulted me on the propriety of inoculating them, but objected to my taking the matter from their father, as he was subject to erysipelas. I advised her by all means to have them inoculated at that time, as I could not procure any variolous matter elsewhere. However, they were inoculated with vaccine matter, but I cannot say I flattered myself with its proving successful, as they had previously been so long and still continued to be exposed to the variolous infection. Notwithstanding this I was agreeably surprised to find the vaccine disease advance and go through its regular course; and, if I may be allowed the expression, to the total extinction of the smallpox.

Mr. Jenner's cases were not less satisfactory. He writes as follows:

> A son of Thomas Stinchcomb, of Woodford, near Berkeley, was infected with the natural smallpox at Bristol, and came home to his father's cottage. Four days after the eruptions had appeared upon the boy, the family (none of which had ever had the smallpox), consisting of the father, mother, and five children, was inoculated with vaccine virus. On the arm of the mother it failed

> to produce the least effect, and she, of course, had the smallpox, but the rest of the family had the cow-pox in the usual way, and were not affected with the smallpox, although they were in the same room, and the children slept in the same bed with their brother who was confined to it with the natural smallpox; and subsequently with their mother.

I attended this family with my brother, Mr. H. Jenner.

The following cases are of too singular a nature to remain unnoticed.

Miss R—, a young lady about five years old, was seized on the evening of the eighth day after inoculation with vaccine virus, with such symptoms as commonly denote the accession of violent fever. Her throat was also a little sore, and there were some uneasy sensations about the muscles of the neck. The day following a rash was perceptible on her face and neck, so much resembling the efflorescence of the *scarlatina anginosa* that I was induced to ask whether Miss R—had been exposed to the contagion of that disease. An answer in the affirmative, and the rapid spreading of the redness over the skin, at once relieved me from much anxiety respecting the nature of the malady, which went through its course in the ordinary way, but not without symptoms which were alarming both to myself and Mr. Lyford, who attended with me. There was no apparent deviation in the ordinary progress of the pustule to a state of maturity from what we see in general; yet there was a total suspension of the *areola* or florid discolouration around it, until the *scarlatina* had retired from the constitution. As soon as the patient was freed from this disease this appearance advanced in the usual way.

The case of Miss H , R , is not less interesting than that of her sister, above related. She was exposed to the contagion of the *scarlatina* at the same time, and sickened almost at the same hour. The symptoms continued severe about twelve hours, when the scarlatina-rash shewed itself faintly upon her face, and partly upon her neck. After remaining two or three hours it suddenly disappeared, and she became perfectly free from every complaint. My surprise at this sudden transition from extreme sickness to health in great measure ceased when I observed that the inoculated pustule had occasioned, in this case, the common efflorescent appearance around it, and that as it approached the centre it was nearly in an erysipelatous state. But the most remarkable part of this history is that, on the fourth day afterwards, so soon as the efflorescence began to die away upon the arm and the pustule to dry up, the *scarlatina* again appeared, her throat became sore, the rash spread all over her. She went fairly through the disease with its common symptoms.

That these were actually cases of *scarlatina* was rendered certain by two servants in the family falling ill at the same time with the distemper, who had been exposed to the infection with the young ladies.

Some there are who suppose the security from the smallpox obtained through the cow-pox will be of a temporary nature only. This supposition is refuted not only by analogy with respect to the habits of diseases of a similar nature, but by incontrovertible facts, which appear in great numbers against it. To those already adduced in the former part of my first treatise 7 many more might be adduced were it deemed necessary; but

among the cases I refer to, one will be found of a person who had the cow-pox fifty-three years before the effect of the smallpox was tried upon him. As he completely resisted it, the intervening period I conceive must necessarily satisfy any reasonable mind. Should further evidence be thought necessary, I shall observe that, among the cases presented to me by Mr. Fry, Mr. Darke, Mr. Tierny, Mr. H. Jenner, and others, there were many whom they inoculated ineffectually with variolous matter, who had gone through the cow-pox many years before this trial was made.

It has been imagined that the cow-pox is capable of being communicated from one person to another by effluvia without the intervention of inoculation. My experiments, made with the design of ascertaining this important point, all tend to establish my original position, that it is not infectious except by contact. I have never hesitated to suffer those on whose arms there were pustules exhaling the effluvia from associating or even sleeping with others who never had experienced either the cow-pox or the smallpox. And, further, I have repeatedly, among children, caused the uninfected to breathe over the inoculated vaccine pustules during their whole progress, yet these experiments were tried without the least effect. However, to submit a matter so important to a still further scrutiny, I desired Mr. H. Jenner to make any further experiments which might strike him as most likely to establish or refute what had been advanced on this subject. He has since informed me that he inoculated children at the breast, whose mothers had not gone through either the smallpox or the cow-pox; that he had inoculated mothers whose sucking infants have never undergone either of these diseases; that the effluvia from the inoculated pustules, in either case, had been inhaled from day to day during the whole progress of their maturation, and that there was not the least perceptible effect from these exposures. One woman he inoculated about a week previous to her *accouchement,* that her infant might be the more fully and conveniently exposed to the pustule; but, as in the former instances, no infection was given, although the child frequently slept on the arm of its mother with its nostrils and mouth exposed to the pustule in the fullest state of maturity. In a word, is it not impossible for the cow-pox, whose *only* manifestation appears to consist in the pustules *created by contact,* to produce *itself* by effluvia?

In the course of a late inoculation I observed an appearance which it may be proper here to relate. The punctured part on a boy's arm (who was inoculated with fresh limpid virus) on the sixth day, instead of shewing a beginning vesicle, which is usual in the cow-pox at that period, was encrusted over with a rugged, amber-coloured scab. The scab continued to spread and increase in thickness for some days, when, at its edges, a vesicated ring appeared, and the disease went through its ordinary course, the boy having had soreness in the axilla and some slight indisposition. With the fluid matter taken from his arm five persons were inoculated. In one it took no effect. In another it produced a perfect pustule without any deviation from the common appearance; but in the other three the progress of the inflammation was exactly similar to the instance which afforded the virus for their inoculation; there was a creeping scab of a loose texture, and subsequently the formation of limpid fluid at its edges. As these people were all employed in laborious exercises, it is possible that these anomalous appearances might

owe their origin to the friction of the clothes on the newly inflamed part of the arm. I have not yet had an opportunity of exposing them to the smallpox

In the early part of this inquiry I felt far more anxious respecting the inflammation of the inoculated arm than at present; yet that this affection will go on to a greater extent than could be wished is a circumstance sometimes to be expected. As this can be checked, or even entirely subdued, by very simple means, I see no reason why the patient should feel an uneasy hour because an application may not be absolutely necessary. About the tenth or eleventh day, if the pustule has proceeded regularly, the appearance of the arm will almost to a certainty indicate whether this is to be expected or not. Should it happen, nothing more need be done than to apply a single drop of the *aqua lythargyri acetati* upon the pustule, and, having suffered it to remain two or three minutes, to cover the efflorescence surrounding the pustule with a piece of linen dipped in the *aqua lythargyri compos.* The former may be repeated twice or thrice during the day, the latter as often as it may feel agreeable to the patient.

When the scab is prematurely rubbed off (a circumstance not unfrequent among children and working people), the application of a little *aqua lythargyri acet.* to the part immediately coagulates the surface, which supplies its place, and prevents a sore.

In my former treatises on this subject I have remarked that the human constitution frequently retains its susceptibility to the smallpox contagion (both from effluvia and contact) after previously feeling its influence. In further corroboration of this declaration many facts have been communicated to me by various correspondents. I shall select one of them

> DEAR SIR:
>
> Society at large must, I think, feel much indebted to you for your Inquiries and Observations on the Nature and Effects of the Variolæ Vaccinæ, etc., etc. As I conceive what I am now about to communicate to be of some importance, I imagine it cannot be uninteresting to you, especially as it will serve to corroborate your assertion of the susceptibility of the human system of the variolous contagion, although it has previously been made sensible of its action. In November, 1793, I was desired to inoculate a person with the smallpox. I took the variolous matter from a child under the disease in the natural way, who had a large burthen of distinct pustules. The mother of the child being desirous of seeing my method of communicating the disease by inoculation, after having opened a pustule, I introduced the point of my lancet in the usual way on the back part of my own hand, and thought no more of it until I felt a sensation in the part which reminded me of the transaction. This happened upon the third day; on the fourth there were all the appearances common to inoculation, at which I was not at all surprised, nor did I feel myself uneasy upon perceiving the inflammation continue to increase to the sixth and seventh day, accompanied with a very small quantity of fluid, repeated experiments having taught me it might happen so with persons

> who had undergone the disease, and yet would escape any constitutional affection; but I was not so fortunate; for on the eighth day I was seized with all the symptoms of the eruptive fever, but in a much more violent degree than when I was before inoculated, which was about eighteen years previous to this, when I had a considerable number of pustules. I must confess I was now greatly alarmed, although I had been much engaged in the smallpox, having at different times inoculated not less than two thousand persons. I was convinced my present indisposition proceeded from the insertion of the variolous matter, and, therefore, anxiously looked for an eruption. On the tenth day I felt a very unpleasant sensation of stillness and heat on each side of my face near my ear, and the fever began to decline. The affection in my face soon terminated in three or four pustules attended with inflammation, but which did not maturate, and I was presently well.
>
> I remain, dard sir, etc.,
> THOMAS ILES.

This inquiry is not now so much in its infancy as to restrain me from speaking more positively than formerly on the important point of scrophula as connected with the smallpox.

Every practitioner in medicine who has extensively inoculated with the smallpox, or has attended many of those who have had the distemper in the natural way, must acknowledge that he has frequently seen scrophulous affections, in some form or another, sometimes rather quickly shewing themselves after the recovery of the patients. Conceiving this fact to be admitted, as I presume it must be by all who have carefully attended to the subject, may I not ask whether it does not appear probable that the general introduction of the smallpox into Europe has not been among the most conductive means in exciting that formidable foe to health? Having attentively watched the effects of the cow-pox in this respect, I am happy in being able to declare that the disease does not appear to have the least tendency to produce this destructive malady.

The scepticism that appeared, even among the most enlightened of medical men when my sentiments on the important subject of the cow-pox were first promulgated, was highly laudable. To have admitted the truth of a doctrine, at once so novel and so unlike any thing that ever had appeared in the annals of medicine, without the test of the most rigid scrutiny, would have bordered upon temerity; but now, when that scrutiny has taken place, not only among ourselves, but in the first professional circles in Europe, and when it has been uniformly found in such abundant instances that the human frame, when once it has felt the influence of the genuine cow-pox in the way that has been described, is never afterwards at any period of its existence assailable by the smallpox, may I not with perfect confidence congratulate my country and society at large on their beholding, in the mild form of the cow-pox, an antidote that is capable of extirpating from the earth a disease which is every hour devouring its victims; a disease that has ever been considered as the severest scourge of the human race!

AN ACCOUNT OF A PECULIAR DISEASE OF THE HEART

Sir David Dundas, ESQ. SERJEANT SURGEON TO HIS MAJESTY

The following paper is often referenced by the incorrect title:

> *an account of nine cases of rheumatic endocarditis*. This following paper is a compendium of cases treated over a 36 year period in the career of David Dundas, Esq. This careful study established a relationship between acute rheumatism and carditis. This account linking rheumatic fever and a form of heart disease, was the first by any medical author. This work was first read on November 26th, 1808, and first published in Medico-Chirurgical Transactions 1:.37-40, in 1809 and reprinted in *The Eclectic Repertory and Analytical Review*. Vol. I, No. III. Pp. [257]-391, (Philadelphia): April, 1811. (White 2009)

THERE is a disease of the heart, which I apprehend is not very uncommon, no less than nine cases of it having, in the course of thirty-six years, fallen under my care. I have also heard of several other cases, and yet I do not believe any account of it is to be found in any medical author.

The patient complains of great anxiety and oppression at the praecordia; has generally a short cough, and a difficulty of breathing, which is so much increased by motion or by any exertion, as to occasion an apprehension that a very little additional motion would extinguish life. There is also frequently an acute pain in the region of the heart, but not always.

The difficulty of breathing is also aggravated by taking even a small quantity of food.

He prefers lying on the back, complains of great palpitation of the heart, and violent pulsation of the carotid arteries, attended with noise in the ears and giddiness of the head.

In some cases I have found the action of the heart so very strong as to be distinctly heard, and to agitate the bed the patient is in so violently, that the pulse of the patient could be counted by looking at the motion of the curtains of the bed.

The pulse is always very quick, and is often irregular: in some cases it has been weak, but more commonly very hard.

Towards the conclusion of the disease symptoms of water in the chest take place, the legs become oedematous, and frequently a considerable collection of water is accumulated in the abdomen.

In all the cases which I have seen, this disease has succeeded one or more attacks of rheumatic fever. In one case the affection of the heart appeared at the commencement of the rheumatic fever, and its action was so rapid, that the pulse could not be counted for many days; much difficulty of breathing and oppression attended with a sense of great debility took place, and the inflammation, pain, and swelling of the extremities, after having shifted from one joint to another for many weeks, subsided; but the affection of the heart continued, generally attended with great pain, producing in the progress of the disease, and towards its close, a considerable disposition to dropsy, under which the patient lingered for ten months.

All those I have seen afflicted with this disease were young persons; only two were above twenty-two years of age. Six of them were males, and three females.

Most of them struggled with the disease for many months. Seven of the nine have died. One I am attending at present, and I think cannot recover; and one is apparently well, having survived the attack four years. He has had no rheumatic affection for two years and a half, but the action of the heart is still very violent and easily increased by exercise. His recovery is attributed to a very strict adherence for a long time to a vegetable and milk diet, and great attention to avoid any considerable exertion.

Of the seven cases which proved fatal, six have been opened, and all of them agree in the general appearance of the heart. In all the heart was uniformly found to be enlarged, in some, the enlargement was much more considerable than in others. In one case water was found in the pericardium, in all the others the pericardium adhered to the heart. The left ventricle, in all the cases, was most enlarged in size, but not in thickness, and in most of them the heart was found of an unusually pale colour, and very soft and tender in its texture.

In one case, the examination of which was made by Mr. Chilver, in the presence of Sir Walter Farquhar, Dr. Baillie, Dr. Saunders, Dr. Gillan, and myself, Dr. Baillie thus describes the appearance of the heart. "The pericardium was found closely adhering in every part to the surface of the heart. The heart itself had increased wonderfully in size; it was at least three times the size of a healthy heart. The muscular structure was, however, not encreased in thickness beyond what it commonly is, so that its powers of action were not augmented proportionably to its bulk. As the quantity of blood in this heart was much larger than is natural, (for instead of a few ounces it contained almost a quart of blood) its powers of propelling this blood to the different parts of the body must have been much diminished below the common standard."

Mr. Thomas, of Leicester-square, gives the following account of the examination of the body of a young gentlemen (who died of this disease,) at which I was prevented from being present. "The heart was somewhat larger than common, and the enlargement was con-fined principally to the left side. It was of a pale colour, extremely soft and

tender in its texture, and its cavities were filled with coagulated blood, having but a slight cohesion of its component parts. Nothing remarkable presented itself in the right auricle and ventricle; but upon opening the left ventricle was found an irregular excrescence of the nature of polypus, attached to, and nearly occupying the whole of one of the valvulae mitrales."

I have an account of a case so far back as the year 1770, in which all the apperances correspond almost exactly with those in the case described by Dr. Baillie. The heart is mentioned to have been three times its usual size; the pericardium adhered to the left ventricle, which was inflamed, and was thinner than the right. Where the pericardium did not adhere, a small quantity of water was found in it.

I examined lately, the body of a young lady who died of this disease, in presence of Mr. Nixon and Mr. Jones, surgeons, at Hampton and found the heart of an unusual size, and the pericardium adhering closely in every part to it. The substance of the heart was of a pale colour, and the texture of it was so tender, that the finger could with great ease be pushed through it. It was chiefly enlarged on the left side, but its muscular structure was not increased in thickness. The valvulae mitrales were edged with a substance of a spongy appearance, perhaps coagulated lymph.

I have an account of an incipient attack of this disease, judiciously and successfully treated by Dr. Pemberton. His account of the case is so very distinct, and in many respects corresponds so exactly with the disease I have described, that I will take the liberty to give it in the Doctor's own words.

"Mr. had been in his youth, and indeed even to the time he was taken ill, (aged 36) subject to the acute rheumatism. He had been particularly troubled with this complaint during the whole of the winter immediately preceding the affection of the heart, which took place in March. He was seized with a considerable pain at the heart, and a difficulty of respiration, great palpitation and great anxiety. He conceived that the smallest motion of the body would have instantly destroyed him, and this dread seemed to have totally bereft him of the power of utterance. He sat for six or eight hours without being able to articulate a sound, though he was conscious of what was going on about him. He had frequent rigors, and almost constant profuse sweats. Cordials of various sorts were given him, till he appeared in a slight degree more composed, when a small quantity of blood was taken from the arm. This did not appear buffy. In about three days he ventured to move from the chair where he had remained from the first attack, but upon the slightest exertion the palpitation and anxiety were renewed. When he remained perfectly at rest the palpitation was hardly observable.

"In about a fortnight all his apprehensions of death seemed re-moved; but still on the most trifling exertion he was reminded of his former sufferings, so that for a month he scarcely moved at all.

"By placing the hand upon the heart, there appeared a very great throbbing, which beat up the carotids so much as to occasion a most unpleasant noise in the head.

"On considering the circumstances of this case, I was inclined to suspect that a small portion of the surface of the heart had been affected with inflammation, and that

in consequence, a partial adhesion had taken place between it and the pericardium. The plan recommended, was a seton in the region of the heart, and a pill composed of three grains of the succus spissatus cicutae, and half a grain of the powder of digitalis, three times a day, abstinence from all fermented liquors, and a moderate quantity of animal food.

"The irregular action of the heart continued at intervals for eight months, when it gradually lessened, so that in about a year there remained no symptoms of the former complaint, and Mr. is now (at the distance of four years) equal to undergo any exertion or fatigue without producing any irregularity of the heart's action."

The knowledge that this disease is always the consequence of, or is connected with, rheumatic affection, points out the necessity of attending to the translation of rheumatism to the chest; and shews the importance of employing very vigorous measures to remove it as soon as possible; but whenever it has made any considerable progress, I fear it will baffle every effort.

20th *November, 1806.*

Since writing the above I have been favoured by Dr. Marcet with an account of two cases of translation of rheumatism from the extremities to the chest, producing several of the symptoms I have noticed; but not in so marked a degree as in the cases I have seen. Both these patients died, and were opened, and in both of them the heart was found to be much enlarged. I also last year attended a person aged 29, who had twice had the acute rheumatism; but having been wet through last September, was seized with shiverings, succeeded by a pain across the chest, great difficulty of breathing, which was increased by the slightest motion, a very strong palpitation of the heart, and violent action of the carotid arteries, accompanied with a sense of great debility, and an apprehension she was just going to expire.

She had been in this state for a fortnight, before I saw her. She had not been able to go to bed for many nights; her legs and thighs were much swollen, and her pulse, which was very weak, was so quick, that it could not be counted. She had no cough. She submitted to have a blister applied to the region of the heart, but would not allow an issue to be made. By the use of the digitalis her pulse became less frequent; but as it disordered her head and stomach she was obliged to relinquish it. The action of the heart now was tremendous; she daily became weaker, although her appetite continued good to the last, and she died at the end of two months.

She was opened in the presence of Mr. Taylor, of Kingston. The lungs on the left side had very little space to act in, the heart, which was enlarged to a most extraordinary size, occupying the greater part of the left side of the thorax. The lungs were found, on both sides, to have strong adhesions to the pleura; and above a pint of water was found in the cavity of the thorax. A considerable quantity of water was contained in the abdomen. All the abdominal viscera were sound, except the spleen, which was of a much paler colour and softer texture than usual.

BRIEF OUTLINE OF A PLAN FOR DIMINISHING THE PREVALENCE AND FATAL TENDENCY OF HOOPING-COUGH

Henry Edmonstone

This paper shows that Henry Edmonstone recognized the serious contagious nature of disease. Whooping cough was first described as a highly malignant form of plague and was only caught by inhaling the breath or touching the infected person. With vaccination still controversial and the science of immunology in infancy, isolation came to the forefront of a method of preventing many diseases. Edmonstone noted there was no obvious symptom preceding the fatal disease and recommended that persons affected with hooping-cough wear some conspicuous article of clothing, so they could be avoided. This work was first published in the Edinburgh Medical & Surgical Journal 6: 16-20 1811. (White 2009)

THE mortality which hooping-cough produces among the children of this country, is a perpetual source of sorrow and anxiety to all classes of the community. Its ravages are not confined to the victims which it carries off in its progress; in many of those who escape its immediate effects, it lays the foundation of complaints that prove equally destructive, or it induces a predisposition to pulmonary affections, which otherwise might never have existed.

No period of life is altogether exempt from the disease, although the constitution appears to be most obnoxious to its attacks during infancy and childhood. It occurs in every situation, and at all seasons of the year. It possesses a period of rise and decline, and is well known to be one of those diseases that affect the system only once during life.

As the pathology of the disease is but imperfectly understood, and the means of cure extremely circumscribed, it becomes necessary to endeavour to compensate these defects, by taking advantage of certain peculiarities of action, to which the contagion is known to be subjected; and from thence to deduce such principles of preventive treatment, as shall tend to counteract the baneful influence of the disorder, and render it less generally diffused.

One of the best established and more remarkable of these peculiarities in the history of hooping-cough, is, that the severity and danger attending the disease, are in the inverse ratio of the age of the patient; or, in other words, the younger the patient,

the greater is the hazard to which health and life are exposed. In proportion as the constitution acquires vigour and stability, the danger becomes comparatively trifling; and after the age of puberty, ceases almost entirely, together with the susceptibility of the disease. Another circumstance, with regard to the operation of the contagious principle, particularly deserving of attention, is, that hooping-cough is observed to be much milder in warm than in cold climates; and it would seem to be conformity to this law, that the disease is found to be more severe in this country during autumn and winter, than during spring and summer. It is not necessary here to enter into any discussion respecting the causes of these differences, in the degrees of danger and severity, arising from age, climate, or season. It is sufficient that experience has established the fact of their uniform occurrence. The two important practical rules which result immediately from them, and to which I am, on the present occasion, particularly anxious to direct the attention of the public, are the following.

> *To use every precaution to guard against the hooping-cough, during the very early stages of life: and, to avoid its attack during the unfavourable season of the year.*

The possession of means, therefore, that could subject the disease to our control, so far as to enable us to select the favourable periods, with respect to age and atmospheric temperature, must necessarily have the effect of lessening the violence of the disease; and consequently, of contributing to the preservation of many lives, whose loss we must otherwise continue to deplore. Much of the continued and extensive prevalence of hooping-cough, and many of the fatal consequences resulting from its agency, are undoubtedly to be attributed to extreme inattention on the part of the public at large. Infected children are suffered to mix with their companions in the streets, at play, and at school, without any intimation being given to the uninfected of the existence of the disease. Almost every other contagious disorder manifests itself by some obvious symptom or appearance, or its operation is so violent, that the patient is confined at home until the risk of communicating it has entirely ceased. But hooping-cough, during the intervals of its paroxysms, exhibits no external marks by which its presence can be detected; the general health is seldom or never affected while the patient is able to go abroad; and consequently, the healthy often mingle with the diseased, without being aware of the danger to which they are exposed. There are no means of ascertaining whether or not the disease exists, but by actually witnessing a fit of coughing; and in general, before this can have taken place, the disease has been imparted, and escape rendered impracticable.

In other instances, where the intervals between the paroxysms are very protracted, there is no opportunity afforded of observing a fit of coughing; and the contagion may thus be carried, by means of a third person, and communicated, perhaps, to a whole family of children, without the possibility even of a suspicion being entertained.

Sources of contagion are thus generated and multiplied to an indefinite extent, and with powers of propagation so indiscriminate in their operation, that they can scarcely

fail, in the cold and variable climate of this country, to be sometimes productive of the most fatal consequences.

As the disease, then, cannot be recognized until too late to prevent its attack, the framing of some expedient, by which those labouring under it could be easily known and avoided, would seem to present the most simple and effectual means of security against its insidious mode of invasion, and of rendering its dissemination less extensively injurious.

I would therefore propose, that persons affected with hoopingcough should wear some conspicuous article of dress, by which they might be discerned easily at a distance, and an opportunity, by that means, offered to all who might be so inclined; of keeping beyond the sphere of the contagion. A red hat, cap, or ribbon, for example, might be worn for this purpose. As ornaments of this colour are seldom used for the head, the facility of distinguishing the infected persons would be rendered so much the greater. Children ought not to be permitted to go to school or to church, while suffering from the disease; nor should they, after having been affected with it, be considered admissible into any seminary or situation where numbers are assembled, unless they can produce a certificate, signed by the medical attendant of the family, stating that the danger of infection is over.

As it is impossible, without the interference of the legislature, to render compulsory the above regulations, the carrying them into effect must be left entirely to the good sense and humanity of the public. These, if duly exerted, will be found fully adequate to the purpose, as every individual, however indifferent or careless, cannot but be aware, that the neglect of any of these conditions, must subject him to the reproach of his fellow-citizens, for having violated, not only his obligations to society, but also the sacred duties of humanity.

With a general feeling of this kind on the public mind, the competency and success of the plan I have proposed, would soon cease to be doubtful. One advantage, I presume, it will be allowed to possess. It may be adopted with equal facility by all ranks and descriptions of people; for it involves neither expense nor inconvenience.

I appeal, therefore, with confidence, to parents, guardians, and all who possess influence, and who are interested in the fate of the rising generation, to give it their support, and to promote its favourable reception, by their example.

My expectations may perhaps be deemed visionary; but I am, notwithstanding, strongly impressed with the belief, that, by a strict adherence to the above plan, there are rational grounds for indulging the hope, so consolatory to every feeling mind, that the hoopingcough shall be divested of many of its dangers, and instead of being anticipated with terror and alarm, it shall at last come to be viewed with indifference.

If the preceding observations shall prove in any respect instrumental in promoting so beneficial an object, the design with which they have been written will have been fully and happily accomplished.

Sept. 1810.

October 2. Since writing the above, I have been much gratified on seeing, in some extracts, published in the 24th Number of the Edinburgh Medical and Surgical Journal, from Jackson's Account of Marocco, the following facts mentioned.

"Leprosy being considered epidemical, those who are affected with it, are obliged to wear a badge of distinction whenever they leave their habitations; so that a straw hat, with a very wide brim, tied on in a very particular manner, is the signal for persons not to approach the wearer." If such a precaution be considered necessary for the prevention of leprosy, which at least discovers itself by the "total want of eyebrows" in those who are, or have been affected with it, how much more necessary is it in hooping-cough, which is so much more destructive to life, and in which there is no appearance to indicate its presence? Indeed, some such contrivance might be beneficially applied to all contagious diseases, each disease being distinguished by its peculiar device; and although we could scarcely expect to limit, in any very material degree, the aggregate dissemination of any disease, we might at all events, be able to render it less indiscriminate in its operation: besides, the certainty of exposure having taken place, would, by preparing us for the attack, put it in our power to counteract its effects.

OBSERVATIONS ON THE DROPSY, WHICH SUCCEEDS SCARLET FEVER

William Charles Wells, M. D. &C., FRS

This paper like the work by Sir David Dundas in 1808 also establishes a relationship between a rheumatic type fever and heart disease. In particular this work by William Wells (1757-1817) focuses on the clinical manifestations that appear after cases of scarlet fever. He proposes scarlet fever is linked to congestive heart disease. He is credited for being the first to appreciate natural selection and read his findings before the Royal Society in 1813. This edition of his work first appeared in the *Transactions of the Society for the Improvement of Medical and Chirurgical Knowledge 3: 167-185, in 1812.* (White 2009)

THOUGH the dropsy after scarlet fever occurs frequently in this country, none of our authors, as far as I know, have given a tolerably good account of it. I shall therefore attempt to describe it, partly from my own observations, and partly from those of Plenciz, a physician of Vienna, whose works, I believe, are little known in England. The whole, indeed, of what I shall say will not form a history of the disease; but possibly some person may hence be excited to fill up the chasms which I shall leave, and amend my errors; for by ceasing to be physician to the Finsbury Dispensary about seven years ago, I lost my chief opportunity of seeing this disease, soon after my attention had, by accident, been particularly turned towards it.

The dropsy succeding scarlet fever seems to be of much more importance in some places than in others. Dr. Cullen, in his First Lines, speaks of it as being of very easy cure, and for this reason, I suppose, bestows only a few words both upon its history and method of treatment: whereas Plenciz says, that in Vienna more persons die of it than of the original fever. In London it is certainly not so slight a disease as it appears to have been in Edinburgh, during the residence there of Dr. Cullen; nor has it hitherto been nearly so fatal here, as it was at Vienna in the time of Plenciz.

This species of dropsy is preceded several days, perhaps always by langour and peevishness, most commonly by a costive state of the bowels, and frequently by sickness and vomiting.

Its first appearance is generally on the twenty-second or twenty-third day after the commencement of the preceding fever. If I can trust, however, to the report of a

careful mother, it may come on as early as the sixteenth day; and I know from my own observation, that its attack may be delayed to the twenty-fifth. When it has not appeared before the end of the fourth week, I have always ventured to affirm, that its attack was no longer to be dreaded.

Infants and very young persons are almost the only sufferers from it. The oldest person whom I have known affected with it was a girl of seventeen years. The rare occurrence, however, of the scarlet fever in older persons, may be the reason of my not having observed the consequent dropsy in any of greater age.

When one child of a family has been attacked with this disease, the other children of the same family, who have lately passed through the scarlet fever, are more liable to become dropsical, than the children of another family, who have also lately laboured under that fever, but among whom no instance of the dropsy has yet occurred. This seems to depend, in part, upon a similarity of constitution derived from common parents, and, in part, upon a sameness in the external circumstances, in which the children of the same family are commonly placed.

Plenciz says, that it occurs more frequently in winter than in summer, and in such as are exposed early to the open air, after having passed through the fever, than in those who remain longer at home. In consequence of the latter observation, I have always advised, that those who have laboured under the scarlet fever should not go into the air, till four weeks have elapsed from the first appearance of that disease.

Contrary to what might have been expected, the dropsy often comes on after a very mild fever, and when the person, who had suffered it, appears to have nearly or altogether recovered his former health; while it frequently does not occur in those, who have passed through a very dangerous fever. I have indeed never seen it after those severe cases, which are known by the title of putrid sore throat. But Plenciz says, that it follows most commonly a considerable fever; and yet, after describing a dangerous variety of the fever, he adds, that he never saw the dropsy follow it. He observes also, that those who have suffered a great desquamation of the skin are the most liable to the dropsy.

Another fact in the history of this disease, that might not have been expected, and which, I believe, is taken notice of by no author besides Plenciz, is, that the swelling constantly begins in the face.' Very often, indeed, it never goes farther, even in cases of great danger; when it extends beyond the face, it more readily affects the hands than the feet. Plenciz expresses himself as if the swelling always affected the whole body; but this is comparatively a rare occurrence with us.

I have seen only two patients on the first day of their disease. In one of them, a boy of eight years of age, the pulse seemed to my feeling, for I had no instrument to measure it by, slower than in health; in the other, a boy five years old, it was only fifty-eight in a minute. In both, the force and the intervals of the beats were somewhat unequal; in short, their pulse resembled very exactly that which occurs in the second stage of dropsy of the brain. On the third day, it began to be quick in both, and continued so throughout the disease. I never saw a case, however mild, in which the pulse on the

fourth day was not much quickened. But Plenciz speaks of it as a frequent occurrence, that no fever attends this disease; and says, that if there be fever, a favourable event is scarcely to be expected.

In the beginning of the disease the urine is scanty, and is, I believe, commonly turbid at the time of its being passed. I have in several cases allowed the urine in this stage of the disease to remain undisturbed for some hours, when it has assumed an appearance not hitherto observed by me in any other disorder. For there was at the bottom a very white flocculent matter, and above, a fluid of a pale white colour, and somewhat turbid; the whole resembling a mixture of soft curd of milk and whey, when the latter has floating through it very small particles of the curd. The patients, though they make but little water, have sometimes a frequent desire to discharge it, and in this case, a pain is felt by them in the region of the bladder when it is pressed. The urine, however, generally does not remain long scanty. A boy eight years old, in the course of the fifth day made thirty ounces of urine, and he continued to make about that quantity daily, during a long and dangerous disease. After the urine has become copious, it is still often turbid when passed, from numerous small films floating through it. If such urine be suffered to remain unshaken for some hours, the films fall to the bottom, and the fluid above becomes clear. About the end of the first week, or beginning of the second, but sometimes later, the urine now and then assumes a pale red or pinky colour, and in this state resembles much the washings of raw flesh in water. Plenciz asserts, that this happens in the greater number of cases, and seems to say, that it takes place at the very beginning of the disease. But I believe him to be very inaccurate with respect to both of these circumstances. This red urine is also turbid when made, and rendered clear by standing. After a time, differing in different persons, the redness disappears; but the urine is still turbid when made, and continues to be so for a week or two. In one patient, into the circumstances of whose case I had frequent opportunities of inquiring, the urine became red on the sixth day of the disease, and remained so till the twentieth; in another, who died on the ninth day, it became red on the eighth. I may mention here, in opposition to Plenciz, that when the red colour has once disappeared, I never saw it return. He affirms too, that the presence of the red colour ought to have no influence on our prognosis in this disease; but in my practice, the patients that have had this symptom have recovered more slowly, than those who were without it.

The urine in this state having precisely the appearance, which is given to healthy urine by dissolving in it the red matter of blood, it appeared to me probable, that the red colour of the diseased urine depended upon the presence of the same matter. To put this opinion to the test of experiment, I exposed some of the diseased red urine to the heat of boiling water, upon which there formed in it numerous flocculi of a dirty brown colour. These being suffered to fall to the bottom, the fluid above became clear, and of the colour of pale common urine. There is, therefore, no doubt of the unusual colour being occasioned by the presence of the red matter of blood. Having seen, likewise, at the bottom of such urine, a number of small black grains, I washed a parcel of them, and infused them in water. This was soon made red; I then exposed the infusion to heat, in

consequence of which similar flocculi were formed, and upon their subsiding the fluid appeared altogether without colour. These grains, therefore, must also have contained the red matter of blood. Such urine as that which I have just described, has never been observed by me in any other disease. I have sometimes also observed the urine, both shortly before and shortly after it has been red, to be of a brown colour. When such urine was exposed to heat, a brown coagulum was formed, upon the falling of which to the bottom, the fluid became pale. At the bottom of urine of this kind I have seen small brown grains. I once dissolved some of these in water, and boiled the solution, which in consequence separated into a brown sediment, and a colourless fluid.

There is another part of the blood, which I have almost always found present in the urine of persons affected with this dropsy, which is the serum. For in all the cases of it, except two that were very slight, in which I exposed the urine to the heat of boiling water, a flocculent matter formed in it, which, when the urine was not red, was of a white colour. The urine of one patient contained a little serum thirty-eight, and that of another forty-two days, after the accession of the dropsy. Probably serum would have been found in the urine of both those patients, had it been examined at much later periods. After I had discovered this fact, I was no longer surprised at what had formerly seemed to me very strange, that a person, who was recovering from this disease, should eat heartily, sleep well, and apparently have no extraordinary evacuation, and should yet remain long very feeble.

Sickness, vomiting, and costiveness are often present during the dropsy, as well as before its attack: but I have not found that its danger is strictly connected with the degree of those circumstances. The most obstinate costiveness I have met with in this disease occurred in a boy, in whom all the other symptoms were very slight. For the most part, the bowels, when bound, are loosened with little difficulty. The abdomen, even when not apparently swelled, often feels hard, and pain is often excited by the hand being pressed against any part of it.

Symptoms of extreme danger sometimes appear as early as the third day after the face has begun to swell. When the disease has continued mild for ten or eleven days, I never knew it to give much alarm afterwards.

The appearances of danger are various. Sometimes they arise from an affection of the head. A girl, eight years old, on the morning of the third day of the disease, complained of head-ache, which in the course of the same day became extremely violent. In the evening she was seized with convulsions, which, from the report of her mother, continued nineteen-hours, with scarcely any intermission. They then ceased, but returned in two hours. In this interval, it was discovered that she was blind, and that her pupils were much dilated. The convulsions, after they returned, continued thirty-six hours; and the patient remained blind eight hours after they left her. This child recovered. Her swellings, which were confined to the face and hands, disappeared while the convulsions were present, but returned after they had ceased.[2] A boy, thirteen years of age, on the morning of the seventh day after his face had begun to swell, was seized with head-ache; in the evening his limbs were convulsed, and his sight was almost entirely lost. His memory,

however, and the other faculties of his mind, seemed unimpaired. The convulsions ceased after half an hour; but they returned in an hour, and lasted again about half an hour. In this way he was alternately attacked, and relieved eleven times, in twenty hours. When the convulsions had ceased altogether, his sight became less imperfect; but his countenance was pale, and his pulse feeble and very frequent. The following morning he died. It must be mentioned, however, that during the convulsions, and after they had left him, he complained much of a pain in his belly, which was increased by pressure. It is possible, therefore, that the convulsions in this case might have arisen, either wholly or in part, from some disease in the abdomen. The external swellings in this patient also disappeared during the convulsions.

In other cases, the danger seems very clearly to arise from a disease in the abdomen. A boy seven years old, who had shortly before laboured under scarlet fever, was attacked with dropsy, which, on the eighth day after its appearance, the first of my seeing him, occupied in a slight degree the whole surface of the body. The fever had commenced with vomiting and purging, and these symptoms appeared again, two days before he began to swell. On the eleventh day, he complained much of a pain in his bowels; vomiting and purging attacked him a third time, and he died in the course of the night. His stools were scanty and slimy.

But the most frequent source of danger is an effusion of water into the chest, most probably into the cellular substance of the lungs. The external swellings are here more considerable, than when other internal parts of the body are attacked by the dropsy. More pain also of the chest both immediately precedes and accompanies this disease, than is experienced in some other species of hydrothorax, and the symptoms of danger come on much more rapidly, than in any of them. On the other hand, patients in this disease will often recover from a state, in which no hopes of amendment could have been entertained, if the origin of the effusion had been different. It seems to me, indeed, that the disposition to the effusion of water into thevarious cavities of the body, which occurs after scarlet fever, continues only a certain time, at the end of which, if the patient lives to the end of it, the disease may be considered similar to that which would arise, from the forcible injection of water into those cavities of a person, who had no tendency to dropsy. Organic injury may have been induced by the cause of the effusion, and by the presence of the fluid; the powers of life too may have been much enfeebled by the whole previous disease; but still the probability of the fluid being here absorbed must be considerably greater, than in other species of dropsy, where the cause of the effusion generally continues undiminished.

I have never felt a fluctuation of fluid in the abdomen of persons, who had shortly before laboured under scarlet fever; so that I believe ascites, at least in any considerable degree, occurs but rarely after that disease.

When the dropsy has continued long, I have seen swellings of the external lymphatic glands, and large brown scabs in various parts of the skin. Sometimes also various parts of the skin are occupied with superficial ulcers.

Having finished what I had to say of the history of this disease, it will naturally be expected, that I should next treat of the method of curing it. But on this subject I

have very little to mention, that is well founded in experience. As this disease does not often in this country prove fatal, even when there is much apparent danger, and as it very commonly recedes after no long stay, though unopposed by art, our practitioners of medicine sometimes fancy, that they have expelled it by means, which are utterly inadequate to this effect.

If the body be bound, it will be proper to open it; and when respiration has been difficult, I have seen much advantage, for a time at least, from the application of a blister to the chest. When the head has been attacked, I have applied blisters to it likewise; but the disease here is of too great magnitude, and too rapid in its progress, to allow us to suppose, that much benefit can in such a case be derived from them. As I believe the urine to be, for the most part, made in a quantity equal to that which is passed in health, the utility of diuretics may be doubted; but when we consider, that stimulating the kidneys will probably occasion them to transmit more serum, and red matter, of the blood, than they might otherwise do, there will perhaps arise a positive objection to their employment. It may be said, indeed, that a similar objection lies against the use of blisters. I admit it; but their utility in another respect far outweighs the evil, that may accrue from their stimulating the urinary organs.

Were I allowed to speculate on the nature of a disease, which is very much unknown, I should say, that from the frequent desire to make water, and the pain and tension of the coverings of the abdomen, which sometimes occur in the beginning of the dropsy, it seems to me probable, that in such cases the peritonaeum is inflamed; that, if this be admitted, inflammation may be also supposed to exist sometimes in the head and the chest; and, consequently, that bleeding, where danger is urgent, may be employed with advantage. I must add, however, that I have never prescribed bleeding myself in this disease, and that possibly I should not have courage to prescribe it, if a case were to occur to me, in which I might think it proper. Plenciz, indeed, recommends bleeding in affections of the head from this cause; but as he recommends also large bleedings for the cure of the original fever, his authority has not much weight with me. Possibly, the inflammation of the internal membranes, if it does exist, may be similar to that which occurs in the skin during the original fever. This conjecture derives strength from an observation of Plenciz, that the saliva is sometimes bloody, while the original fever and redness of the skin are present.

But whatever opinion may be formed of what I have just said, it seems very evident, that the dropsy, which occurs after scarlet fever is, in the beginning, a symptom of some state of the body, different from debility. For it often attacks those, who either have never been much weakened, or have recovered their strength, while it passes by others whose strength has been much diminished; it appears constantly in the face, before it invades any other external part of the body, and frequently never extends beyond the face; its commencement is confined within certain times, though great weakness may exist both before and after; and, lastly, in one case, where only a slight swelling of the face existed, not even breathlessness being present, the patient had for many days a white tongue, and a frequent bounding pulse.[3]

POSTSCRIPT.

Dr. Blane, on reading the foregoing paper, favoured me with the following remark. "It has been my practice for some years to give repeated purges after scarlet fever, with a view to prevent dropsy, following the analogy of measles; and I do not recollect that dropsy has occurred, where this practice was adopted."

NOTES

I have since learned from Burserius, that this fact is taken notice of in a work published by a Society of Physicians at Florence, in the beginning of the last century. Plenciz's Treatise was printed in 1762.

I have several times observed dropsical swellings from other causes than scarlet fever to disappear during the presence of convulsions.

Since this paper was written, I have found, in Burserius's Institutes of the practice of medicine, a confirmation of my conjecture respecting the existence of internal inflammation, in those who are seized with dropsy after the scarlet fever. He says, that the bodies of several persons, who had died of this disease at Florence, about the year 1717, having been opened, the lungs, pleura, intercostal muscles, diaphragm, kidneys, and intestines were found more or less inflamed; that perineumony having hence been considered as the primary disease, and the dropsical swelling only as a consequence, blood was taken from the arm in the succeeding cases, once or oftener, as the occasion required; and that no one afterwards died of the dropsy who was thus treated. Burserius refers to a work entitled Avvisi sopra la salute umana,' and to a letter of Johannes Calvus in the `Europae Medicina' of Roncalli Parolinus, as his authorities. I have seen the letter of Calvus, and find it to be correctly quoted by Burserius; but have not hitherto met with the Italian work. My opinion concerning the nature of this disease being now supported, both by the appearance of the internal parts after death, and by successful practice, I shall not hesitate to prescribe bleeding in it, when symptoms of danger occur early, from an affection of the head, chest, or abdomen.

ON THE FRACTURE OF THE CARPAL EXTREMITY OF THE RADIUS

Abraham Colles, M.D.

Abraham Colles (1773-1843) was an Irish surgeon and dedicated anatomist. He spent many hours performing dissections and his detailed reference text: *Surgical Anatomy* was published in 1811 is of great value to clinicians. The following paper on fracture of the radius was first published in the *Edinburgh Medical and Surgical Journal* 10, 182-186, in1814. (White 2009)

The injury to which I wish to direct the attention of surgeons, has not, as far as I know, been described by any author; indeed, the form of the carpal extremity of the radius would rather incline us to question its being liable to fracture. The absence of crepitus and of other common symptoms of fracture, together with the swelling which instantly arises in this, as in other injuries of the wrist, render the difficulty of ascertaining the real nature of the case very considerable.

This fracture takes place at about an inch and a half above the carpal extremity of the radius, and exhibits the following appearances.

The posterior surface of the limb presents a considerable deformity; for a depression is seen in the forearm, about an inch and a half above the end of this bone, while a considerable swelling occupies the wrist and the metacarpus. Indeed the carpus and base of metacarpus appear to be thrown backward so much, as on first view to excite a suspicion that the carpus has been dislocated forward.

On viewing the anterior surface of the limb, we observe a considerable fulness, as if caused by the flexor tendons being thrown forwards. The fulness extends upwards to about one-third of the length of the fore-arm, and terminates below at the upper edge of the annular ligament of the wrist. The extremity of the ulna is seen projecting towards the palm and inner edge of the limb; the degree, however, in which this projection takes place, is different in different instances.

If the surgeon proceed to investigate the nature of this injury, he will find that the end of the ulna admits of being readily moved backwards and forwards.

On the posterior surface, he will discover, by the touch, that the swelling on the wrist and metacarpus is not caused entirely by an effusion among the softer parts; he will perceive that the ends of the metacarpal, and second row of carpal bones, form no small part of

it. This, strengthening the suspicion which the first view of the case had excited, leads him to examine, in a more particular manner, the anterior part of the joint; but the want of that solid resistance, which a dislocation of the carpus forward must occasion, forces him to abandon this notion, and leaves him in a state of perplexing uncertainty as to the real nature of injury. He will therefore endeavour to gain some information, by examining the bones of the fore-arm. The facility with which (as was before noticed) the ulna can be moved backward and forward, does not furnish him with any useful hint. When he moves his fingers along the anterior surface of the radius, he finds it more full and prominent than is natural; a similar examination of the posterior surface of this bone, induces him to think that a depression is felt about an inch and a half above its carpal extremity. He now expects to find satisfactory proofs of a fracture of the radius at this spot. For this purpose, he attempts to move the broken pieces of the bone in opposite directions: but, although the patient is by this examination subjected to considerable pain, yet, neither crepitus nor a yielding of the bone at the seat of fracture, nor any other positive evidence of the existence of such an injury is thereby obtained. The patient complains of severe pain as often as an attempt is made to give to the limb the motions of pronation and supination.

If the surgeon lock his hand in that of the patient's, and make extension, even with a moderate force, he restores the limb to its natural form; but the distortion of the limb instantly returns on the extension being removed. Should the facility with which a moderate extension restores the limb to its form, induce the practitioner to treat this as a case of sprain, he will find, after a lapse of time sufficient for the removal of similar swellings, the deformity undimished. Or, should he mistake the case for a dislocation of the wrist, and attempt to retain the parts in situ by tight bandages and splints, the pain caused by the pressure on the back of the wrist will force him to unbind them in a few hours; and, if they be applied more loosly, he will find, at the expiration of a few weeks, that the deformity still exists in its fullest. extent, and that it is now no longer to be removed by making extension of the limb. By such mistakes the patient is doomed to endure for many months considerable lameness and stiffness of the limb, accompanied by severe pains on attempting to bend the hand and fingers. One consolation only remains, that the limb will at some remote period again enjoy perfect freedom in all its motions and be completely exempt from pain; the deformity, however, will remain undiminished through life.

The unfavorable result of some of the first cases of this description which came under my care, forced me to investigate with peculiar anxiety the nature of the injury. But while the absence of crepitus and of the other usual symptoms of fracture rendered the diagnosis extremely difficult, a recollection of the superior strength and thickness of this part of the radius, joined to the mobility of its articulation with the carpus and ulna, rather inclined me to question the possibility of a fracture taking place at this part of the bone. At last, after many unsuccessful trials, I hit upon the following simple method of examination, by which I was enabled to ascertain, that the symptoms above enumerated actually arose from a fracture, seated about an inch and a half above the carpal extremity of the radius.

Let the surgeon apply the fingers of one hand to the seat of the suspected fracture, and, locking the other hand in that of the patient, make a moderate extension, until he

observes the limb restored to its natural form. As soon as this is effected, let him move the patient's hand backward and forward; and he will, at every such attempt, be sensible of a yielding of the fractured ends of the bone, and this to such a degree as must remove all doubt from his mind.

The nature of this injury once ascertained, it will be a very easy matter to explain the different phenomena attendant on it, and to point , out a method of treatment which will prove completely successful. The hard swelling which appears on the back of the hand, is caused by the carpal surface of the radius being directed slightly backwards instead of looking directly downwards. The carpus and metacarpus, retaining thier connections with this bone, must follow it in its derangements, and cause the convexity above alluded to. This change of direction in the articulating surface of the radius is caused by the tendons of the extensor muscles of the thumb, which pass along the posterior surface of the radius in sheaths firmly connected with the inferior extremity of this bone. The broken extremity of the radius being thus drawn backwards, causes the ulna to appear prominent toward the palmar surface, while it is possibly thrown more towards the inner or ulnar side of the limb, by the upper end of the fragment of the radius pressing against it in that direction. The separation of these two bones from each other is facilitated by a previous rupture of their capsular ligament; an event which may readily be occasioned by the violence of the injury. An effusion into the sheaths of the flexor tendons will account for that swelling which occupies the limb anteriorly.

It is obvious that, in the treatment of this fracture, our attention should be principally directed to guard against the carpal end of the radius being drawn backwards. For this purpose, while assistants hold the limb in a middle state between pronation and supination, let a thick and firm compress be applied transversely on the anterior surface of the limb, at the seat of fracture, taking care that it shall not press on the ulna; let this be bound on firmly with a roller, and then let a tin splint, formed to the shape of the arm, be applied to both its anterior and posterior surfaces. In cases where the end of the ulna has appeared much displaced, I have laid a very narrow wooden splint along the naked side of this bone. This latter splint, I now think, should be used in every instance, as, by pressing the extremity of the ulna against the side of the radius, it will tend to oppose the displacement of the fractured end of this bone. It is scarcely necessary to observe, that the two principal splints should be much more narrow at the wrist than those in general use, and should also extend to the roots of the fingers, spreading out so as to give a firm support to the hand. The cases treated on this plan have all recovered without the smallest defect or deformity of the limb, in the ordinary time for the cure of fractures.

I cannot conclude these observations without remarking, that were my opinion to be drawn from these cases only which have occurred to me, I should consider this as by far the most common injury to which the wrist or carpal extremities of the radius and ulna are exposed. During the last three years I have not met with a single instance of Dessault's dislocation of the inferior end of the radius, while I have had opportunities of seeing a vast number of the fracture of the lower end of this bone.

"Stephens Green, February 21, 1814."

A CASE OF APOPLEXY, IN WHICH THE FLESHY PART OF THE HEART WAS CONVERTED INTO FAT

John Cheyne, M.D.

John Cheyne (1777-1836) was a Scottish physician and pathologist known for his 1801 excellent book titled: *Essays of the Diseases of Children* and his breakthrough research in pathology of the larynx. However his name will be forever linked to his description of a bizarre breathing pattern known today as Cheyne-Stokes respiration. His contribution to medicine in Ireland earned him the reputation as the founder of Irish medicine. This work on apoplexy that follows was published in Ireland in the *Dublin Hospital Reports*, Vol 2. pp. 216-223, in1818. (White 2009)

Doubts having been entertained of the conversion of the fleshy part of the heart into fat, and only one dissection, in so far as I know, having been published illustrative of that very curious morbid alteration, the following case and dissection have been thought of sufficient importance to meet the public eye.

In this dissection, although no chemical experiment was made in proof of the matter into which the heart was converted being fatty, I have no doubt that it was so. Placed along side of the fat which lay over the ribs, I could perceive no difference, save that it was softer and more easily torn, and rather of a deeper yellow; the substance in question communicated a greasy stain to paper, and the animal oil in viscous drops adhered to the knife used in dissecting the heart. I was not, at the time of dissection, aware that the morbid change was so uncommon, or that the specimen which lay before me was perhaps the most complete exemplification ever witnessed of the conversion of the flesh of the heart into fat.

The patient certainly died of apoplexy; and apoplexy in this case must have depended upon increased action of the vessels of the head. The heart itself was apparently incapable of communicating much impetus to the circulating mass.

Certainly the dissection would have been more complete had the liver been examined: at the same time I may observe, that although the function of the liver had frequently been disordered during the last ten years of the patient's life, I should not have been surprised had that viscus been found apparently sound. I am persuaded that diseases of the liver, which do not end in structural changes, often produce the greatest disturbance of the constitution, laying the foundation of fatal diseases of distant organs.

A. B., sixty years of age, of a sanguine temperament, circular chest, and full habit of body, for years had lived a very sedentary life, while he indulged habitually in the luxuries of the table.

This gentleman having had several attacks of the gout in his feet, began a course of magnesia in the year 1813, after which he had only one regular attack of the gout. For many years he had been subject to severe attacks of catarrh, which ended without much expectoration. He had long been subject to oedema of the ankles in the evening; for two or three years before his death (the time could not be ascertained) he had remarked an occasional intermission in the pulse of his heart.

In the latter end of January 1816, he consulted me for a pain in his right side under the false ribs, for which he took calomel at bedtime, and salts in the morning, repeating these once or twice; but he neglected my directions with regard to diet; nay, his appetite being remarkably keen, he ate more than usual, and took at least a pint of port wine or Madeira daily, as was his habit, and this notwithstanding a hard frequent cough, which came on after I was consulted by him.

On the third of February he had walked a good many miles and came home exhausted, with a fluttering or palpitation of his heart, for he could not well say which, in a degree he had not felt before. He ate as usual, and drank six or seven glasses of wine, which he thought relieved the fluttering. He was sitting at tea about nine o'clock when he was attacked with a severe fit of coughing, during which he fell from his chair insensible. I saw him in three or four minutes after his fall, and found him with a contusion on the upper and left side of the frontal bone; he was confused, and unable to recollect himself; he was conscious that some accident had befallen him, the exact nature of which he declared himself incapable of understanding. His pulse was extremely irregular and unequal. It bounded quickly for several pulsations, then it paused and went on more quickly, but with less force. He was pale, but none of the muscles were affected with palsy. I lost no time in having blood drawn from his arm to the amount of nearly a pound. He gradually became more collected, but his pulse continued irregular and unequal; his countenance became flushed, the cough occurred in suffocative fits, and he complained of pain on either side of the tuberosity of the occipital bone. Twelve ounces more of blood were drawn about an hour after the first blood-letting, after which the pulse, though it continued equally irregular, was much softer. He complained of the contusion, and of considerable pain behind his ears. He was removed to bed, the heat of the extremities was restored, and fifteen leeches were applied over the contusion, and he took two pills consisting of two grains of James's powder, three of calomel and four of compound extract of colocynth.

On the 4th of February he had several large bilious stools; his understanding was unimpaired, his recollection restored, and he seemed to comprehend the nature of his illness, and he had a sense of fulness in his head, which led me to order him to lose a few more ounces of blood. It would be tedious and unprofitable to particularize the medicines which were ordered from day to day for this patient; they consisted of a mild mercurial every second or third day, and squills with ammoniacum, etc. These were indicated by

the loaded tongue, scanty high coloured urine and dry cough. The expectoration being restored, the squills were laid aside on the 15th of February, as they produced nausea and extreme depression of spirits, and bitter infusion with tincture of cardamoms and soda was prescribed. On the 19th a horse-radish bath was ordered, in consequence of some slight demonstration of gout. On the 21st he had some smart pain, with slight inflammation in the ball of the left great toe. About this period he submitted with so much dissatisfaction to a reduced diet, and declared himself so much better after food, that we were induced to allow him a couple of glasses of wine, and to encourage him to take carriage exercise. The irregularity in his pulse never ceased. On the 1st of March he had a return of the suffocative cough and flushing, with some wheezing, which again seemed to demand blood-letting, which was practised with immediate relief. At this period a blister was applied over the region of the heart, which had become the seat of considerable increase of pain, and a discharge was maintained from the blistered surface, by means of ointment of savine and cantharides; about the 4th of March, the sputa became free and concocted. His tongue at this period was for many days furred and of a dark brown colour, as if it had been sprinkled with ground coffee; it was expanded, and its edge was moist. On the 25th of March he began to complain of wheezing, more particularly after exertion, but it sometimes attacked him when he was at perfect rest; his legs and ankles became oedematous, the urine very scanty, much loaded, but without being coagulable by heat. At no period of his illness did his pulse beat more than twelve, or fifteen strokes in regular succession. Various diuretics were given; the digitalis was proposed, but he re-fused to take it. Crystals of tartar, the extractum lactucae virosae, nitrous aether, etc., were tried without any benefit.

The symptoms of dropsy rapidly increasing, on the 9th of April, he took a draught of infusion of senna, tincture of jalap and Rochelle salts, which operated largely. On the 10th of April he was found in bed flushed, speechless, and hemiplegiac. How long he had been in that state could not be ascertained, as he had peremptorily ordered his servant not to remain in the chamber with him, and not to come to him in the morning till called. All attempts to relieve him were unavailing; his right side continued powerless, and his attempts to articulate were vain. The only peculiarity in the last period of his illness, which lasted eight or nine days, was in the state of the respiration: For several days his breathing was irregular; it would entirely cease for a quarter of a minute, then it would become perceptible, though very low, then by degrees it became heaving and quick, and then it would gradually cease again: this revolution in the state of his breathing occupied about a minute, during which there were about thirty acts of respiration. *

The Dissection was made by Mr. Crampton, the Surgeon General, and witnessed by Mr. John Moor and myself.

There was nothing remarkable in the conuration of the body but the great depth of the chest; the anasarcous swelling of the inferior extremities was considerable.

The scalp was bloodless. The arachnoid membrane was slightly opaque; there was some fluid between it and the pia mater, and the vascularity of the latter was increased, more particularly over the middle and posterior lobes of the cerebrum on the left side,

where, in a large patch, it was thickened and of a deep red colour. The brain was firm, its cortical substance of pale drab colour. There were between three and four ounces of fluid in the ventricles.

There were not more than two ounces of fluid in the pericardium. The heart was about three times its natural size. The lower part of the right ventricle was converted into a soft fatty sub-stance; the upper part was remarkably thin, and it gradually degenerated into this soft fatty substance. The cavity of the left ventricle was greatly enlarged. The whole substance of the left ventricle, with the exception of the internal reticulated structure and carneae columnae, was converted into fat. The valves were sound. The aorta was studded with steatomatous and earthy concretions.

*The same description of breathing was observed by me in a relative of the subject of this case, who also died of a disease of the heart, the exact nature of which however I am ignorant of, not having been permitted to examine the body after death.

AUSCULTATION OF THE VOICE

René-Théophile-Hyacinthe Laënnec

René-Théophile-Hyacinthe Laënnec (1781-1826) was an ingenious French physician responsible for the1816 invention of the revolutionary stethoscope and his 1819 essay on the principles of auscultation. He was able to recognize and describe almost every known physical finding associated with lung disease. This famous work was published as *De l'auscultation médiate, ou traité du diagnostic des maladies des poumons et du coeur, fondé principalement sur ce nouveau moyen d'exploration.* 2 volumes. Paris 1819 by Mériadec Laënnec. It was later republished in 1826 and 1831 in Paris, as well as, in 1822 and 1834 in Germany. The version that follows here is based primarily on Laënnec's findings that were translated into four English editions by Sir John Forbes, between 1821 and 1834, titled: Treatise on the Diseases of the Chest and on Mediate Auscultation 1818. (White 2009)

In the very earliest period of my researches on mediate ausculation I attempted to ascertain the differences which the sound of the voice within the chest might occasion. In examining several subjects with this view I was struck with the discovery of a very singular phenomenon. In the case of a woman, affected with a slight bilious fever and a recent cough having the character of a pulmonary catarrh, on applying the cylinder below the middle of the right clavicle, while she was speaking, her voice seemed to come directly from the chest, and to reach the ear through the central canal of the instrument. This peculiar phenomenon was confined to a space about an inch square, and was not discover-able in any other part of the chest. Being ignorant of the cause of this singularity, I examined, with the view to its elucidation, the greater number of the patients in the hospital, and I found it in about twenty. Almost all these were consumptive cases in an advanced stage of the disease. In some the existence of tubercles was still doubtful, though there was reason to suspect them. Two or three, like the woman above mentioned, had no symptom of this disease, and their robustness seemed to put all fears of it out of the question. Notwithstanding this I began immediately to suspect that this phenomenon might be occasioned by tuberculous excavations in the lungs. The observation of the same thing in patients who had no other symptoms of phthisis did not appear to me conclusive against the correctness of my suspicions, because I knew it to be by no means unusual to find in the lungs of persons carried off by some

acute disease, and who had never shown any sign of consumption, tubercles not only softened, but excavated, and forming the very case denominated ulceration of the lungs. The subsequent death, in the hospital, of the greater number of the individuals who had exhibited this phenomenon enabled me to ascertain the correctness of my supposition: in every case I found excavations in the lungs of various sizes, the consequence of the dissolution of tubercles, and all communicating with bronchial tubes of variable size.

I found this peculiar phenomenon (which I have denominated *pectoriloquy)* to be more perceptible according to the density of the walls of the excavation and its proximity to the superfices of the lungs; and that it was most striking when these adhered to the pleura in such a manner as to render the thoracic parietes almost a part of the walls of the ulcerous excavation a case of very frequent occurrence.

This circumstance naturally led me to think that *pectoriloquy* is occasioned by the superior vibration produced by the voice, in parts having a comparatively more solid and wider extent of surface than the air-cells and small bronchial tubes; and I imagined that, if this were so, the same effect ought to result from the application of the cylinder to the larynx or trachea of a person in health. My conjecture proved correct. There is an almost perfect identity of effect between pectoriloquy and the sound of the voice as heard through the tube resting on the larynx; and this experiment offers an excellent means for giving us an exact notion of the phenomenon when we have not the proper subjects for observation.

The sound of the voice in the different parts of the organs of respiration, and in the different conditions of these, in health and in disease, offers several important varieties which we shall now consider. In a healthy lung it is very slight, whether examined by the naked ear or stethoscope, being only a slight vibration analogous to that felt on applying the hand. I have already noticed the character of the voice on the larynx and trachea: it resounds strongly, traverses the tube of the stethoscope, and prevents the unarmed ear from hearing that issuing from the mouth. The same thing takes place over nearly the whole lateral surface of the neck, and even, in some individuals, towards the nape. On this account, in examining the acromion region, we must remember the precautions stated when speaking of the exploration of the respiration in the same place. The natural resonance of the voice in the throat and nasal fossae is perceptible, more or less, over the whole surface of the head. In that portion of the trachea lying beneath the sternum it sounds loudly, but does not traverse the tube; on this account we must distrust *doubtful* pectoriloquy when it exists only about the upper portion of the sternum.

Bronchophony., The sound of the voice is, in most cases, still more obscure in the larger bronchial trunks at the roots of the lungs, that is, in the interscapular region; nevertheless, it is always somewhat louder in this place, especially about the upper and inner angle of the scapula, than in the other parts of the chest. It is, indeed, very rare for it to be perceived distinctly traversing the stethoscope in a perfectly healthy subject; but it is found to resound so loudly at its extremity as to be more readily heard through the instrument

than the voice issuing from the mouth is heard by the other ear. In persons, however, of a delicate and feeble frame, particularly in lean children, there frequently exists in this situation a *bronchophony* very similar to the *laryngophony* already noticed.

The sound of the voice is scarcely at all perceptible in the bronchi distributed through the lungs when these organs are healthy. This might be expected *a priori,* since the loose texture of the lungs, rendered still more rare by its intermixture with air, is a bad conductor of sound; and the softness of the bronchial branches, after they cease to be cartilaginous, renders them very unfit for its production; while the smallness of their calibre must render whatever sound is produced more acute and weaker in them than in the larger trunks. But if any one of these adverse conditions is removed, and, yet more, if several of them are so at the same time, the sound of the voice may become perceptible in the smaller bronchial tubes. Accordingly it is found that an attack of peripneumony, an extensive haemoptysical induration, or the accumulation of a great number of tubercles in the same point, by condensing the texture of the lungs, gives occasion to a sound analogous to pectoriloquy. This phenomenon, which I denominate *accidental bronchophony, is,* as might be expected, most marked when the pulmonary induration has place near the roots of the lungs. This sign is one of those which serve best to measure the progress of a recent peripneumony.

The dilatation of the bronchi gives rise to the same phenomenon, and the more readily, because the substance of the lungs in the neighborhood of the dilated branches is often more compact than in the natural state. Sometimes two of the causes mentioned conspire to produce it; for instance, the cause just mentioned, and the accumulation of tubercles.

Bronchophony is rarely so like pectoriloquy as to deceive a person even of moderate experience. In the former the voice merely traverses the cylinder; its tone is somewhat like that of a speaking trumpet; and the sound is more diffused in its seat than pectoriloquy. Where any doubt exists, this is removed by the cough and the character of the respiration in the same point: neither of these has the *cavernous* character; we feel assured that the whole phenomena have for their site a series of tubes, and not a circumscribed space.

Pectoriloquy. This phenomenon may be produced under very different circumstances: (1) by the softening of tubercules (by far the most common cause); (2) by the decomposition of a gangrenous eschar; (3) by an abscess, the consequence of peripneumony; (4) by the evacuation of a cyst into the bronchi; and probably also by a fistulous communication between the bronchi and an abscess of the mediastinum.

Pectoriloquy offers great varieties in respect of intensity and completeness. I divided it into *perfect, imperfect,* or *doubtful.*

Pectoriloquy is *perfect* when the transmission of the voice through the stethoscope is complete, and when it, as well as the corresponding results obtained from the exploration of the cough and rhonchus, are exactly circumscribed: in this case, it can never be confounded with bronchophony. It is *imperfect* when some one of those characteristics

is wanting, and particularly if the transmission of the voice be not evident. It is *doubtful* when the sound of the voice is very feeble, and when it can be distinguished from bronchophony only by the aid of other signs derived from the consideration of its site, the general symptoms, and the progress of the disease. These last circumstances suffice, in almost every case, to enable us to distinguish the nature of the excavation.

The circumstances which concur to render pectoriloquy perfect are: the complete emptiness of the excavation, the increased density of the portion of lung which forms its walls, its ready communication with one or more bronchial tubes of a considerable size, and its proximity to the walls of the chest. It is proper to state, however, that whatever be the distance of the cavity from the surface of the lungs, if it possesses the other qualities indicated, it will always yield perfect pectoriloquy, unless, indeed, a very considerable thickness of healthy lung be interposed, which, owing to its defective density, is necessarily a bad conductor of sound. The extent of the excavation contributes also to the completeness of the phenomenon; it is most distinct when this is somewhat considerable; it is , however, often complete when the cavity is very small. On the other hand, pectoriloquy is sometimes very indistinct where the excavations are very large the size of the fist, for instance and when they communicate with the bronchi by small openings.' It has several times been manifest to me that when the number of fistulous openings, by which a very large excavation communicates with the bronchia, increases, pectoriloquy becomes less evident or ceases altogether. It disappears also in the two following cases, viz., when an excavation opens into the pleura, particularly if the opening is large and direct; and when its contents make their way through the walls of the chest into the cellular membrane outside. Pectoriloquy may likewise be some-times suspended for several hours, and even days, by the temporary obstruction of the communication of the cavity with the bronchi by the matter contained in it. We shall hereafter point out the method of obtaining pectoriloquy, or other equivalent signs, in cases of this kind.

Aegophony., The phenomenon to which I have applied this name is, of all those furnished by auscultation, that which seems to me most complex in its causes. It may readily be confounded, by the inexperienced, with pectoriloquy; and still more so with bronchophony. I was myself long guilty of this mistake; and although the distinction is easy when the respective characters of each are strongly marked, there occur cases in which this is hardly practicable. My uncertainty as to the nature of aegophony was of longer duration, because it does not exist in every case of pleurisy; because the analogous phenomenon of bronchophony is still more frequently wanting in peripneumony; because these two diseases, and consequently the two phenomena in question, are frequently combined; and, finally, because the number of fatal cases of these diseases, more particularly of acute pleurisy, is too inconsiderable to afford many opportunities of verifying, by examination after death, the accuracy of the diagnosis derived from auscultation.[2]

Simple aegophony consists in a peculiar sound of the voice which accompanies or follows the articulation of words, it seems as if a kind of silvery voice, of a sharper and

shriller tone than that of the patient, was vibrating on the surface of the lungs, sounding more like the echo of the voice than the voice itself. It rarely appears to enter the tube of the instrument, and scarcely ever passes through it entirely. It has, moreover, another character, so constant as to lead me to derive from it the appellation of the phenomenon, I mean a trembling or bleating sound like the voice of a goat, a character which is the more striking because the key or tone of it approaches that of this animal's voice. When aegophony exists in the vicinity of a large bronchial trunk, particularly towards the root of the lungs, it is frequently combined with more or less of bronchophony. The reunion of these affords numerous varieties, of which we may have a good idea by recollecting the following phenomena: (1) The sound of the voice through a metallic speaking trumpet or cleft reed; (2) that of a person speaking with a counter between his lips and teeth; (3) the nasal intonations of the juggler speaking in the character of Punch. This last comparison is frequently the most exact imaginable, particularly in persons whose voice is somewhat bass (grave). Very commonly, the same individuals who exhibit at the roots of the lungs this combination of the two phenomena yield simple aegophony about the outer and lower edge of the scapula.

The sort of bleating so characteristic of aegophony seems, in most cases, immediately connected with the articulation of words, although the patient's true voice has nothing of the sort: some-times, however, it seems unconnected with the articulation, so that we can hear, at the same time, yet separately, the simple sound of the voice and the bleating silvery sound of aegophony; which last appears to be either nearer or more remote than the resonance of the simple voice. Sometimes, even, when the patient speaks slowly and interruptedly, we hear the bleating, like an imperfect echo, immediately after the voice. These two last-named varieties have appeared to me to exist only in cases of slight effusion. To hear this sound properly we must apply the cylinder strongly to the patient's chest, and place the ear gently on the other end. If the latter is forcibly applied, the bleating sound is diminished one-half, and the phenomenon approaches nearer to bronchophony.

In comparting the results of my early and more recent experience respecting aegophony, it seems to me certain that it exists only in cases of pleurisy, either acute or chronic, attended by a moderate effusion in the pleura, or in hydrothorax or other liquid extravasation in the same cavity.

All the cases in which I have observed aegophony since I have been able to discriminate it from pectoriloquy and bronchophony have, at the same time, afforded other undoubted signs of effusion into the chest. In the examples of pleurisy which I have been able to attend to from their commencement to their close I found it as early as the first hours of the attack; but it has never been observed strongly marked until the second, third, or fourth day, and hardly ever until after the sound of respiration has become almost or altogether imperceptible in the affected side, and until this has yielded the dull sound on percussion. I have observed aegophony in every case of pleurisy which has come under my care during the last five years, except in a few very slight acute cases, where the effusion (as proved by the auscultation of the respiration and

by percussion) was inconsiderable, and in those which did not come under my notice until far advanced and when they were in progress towards recovery. I have discovered this sign in cases where there did not exist above three or four ounces of fluid in the chest. Aegophony decreases and gradually disappears as the effusion is absorbed. In very acute cases it exists frequently two or three days only, and then totally disappears; in the chronic state of the disease with moderate effusion, I havefound it sometimes continue for several months, with variations of intensity proportioned to the varying quantity of the effused fluid. When this is very great, particularly when it is sufficient to cause dilation of the chest, aegophony ceases entirely. I have never observed it in old cases of empyema in which the lungs were compressed upon the mediastinum; but have detected it, in an imperfect degree, in certain cases where the pleura contained from two to three pints of pus and where the lungs were prevented from being quite removed from the side by previous adhesions. On the other hand, I have found that those cases which, when first seen, presented all the other signs of copious effusion except aegophony, yielded this sign also when the dilatation of the side diminished, and the other symptoms indicated the partial absorption of the fluid. In two cases of empyema operated on by my direction in 1821 and 1822 aegophony became much more manifest after the escape of a portion of the pus.

Aegophony is not like pectoriloquy, confined to one point, but extends over a certain continuous portion of the chest. Most frequently it exists, at the same time, over the whole space between the scapula and spine, round the lower angle of the former bone, and in a zone from one to three fingers broad, following the line of the ribs from its middle to the nipple. This portion of the chest evidently corresponds with the internal parts where the effused fluid forms a thin layer on the surface of the lungs; it being well known that, in cases of moderate extravasation, the fluid collects principally in the lower part of the chest, when the patient is seated or resting on the back; and that, even in the cases where the whole surface of the lung is covered by it, the thickness of the layer progressively diminishes from below upwards, and is always much less before than behind. In a very few instances I have detected aegophony, at the commencement of the disease, over the whole affected side; in two of these I ascertained, by examination after death, that this peculiarity depended upon the retention of the lung in partial apposition with the chest, by means of pretty numerous adhesions, so that the lung became invested by a thin layer of fluid over its whole surface. In cases of this kind the sign in question is observable during the whole period of the disease.

I consider aegophony to be owing to the natural resonance of the voice in the bronchial tubes, rendered more distinct by the compression of the pulmonary texture, and by its transmission through a thin layer of fluid in a state of vibration. This opinion is supported by many facts and reasons. The points where it is constantly found correspond with the upper border of the fluid and where it is of least thickness. Moreover, if the patient turns on his face, the sound either disappears or is greatly diminished between the scapula and spine, while it continues on the side; and if he turns on the healthy side, the same result is obtained in the diseased side, now the uppermost. In respect

of the influence of change of position upon this phenomenon, I have observed that the change was much less in cases where the quantity of fluid was either somewhat above or below the mean, than when it was of middling extent. The places formerly mentioned as yielding most distinct aegophony are those where the bronchial tubes are the largest and most numerous. This tends to confirm the truth of the opinion above stated, as well as the fact of the cessation of the sign when the effusion becomes very copious, and its return on this being diminished: in the former case it is evident that the bronchi, as well as the lungs, must be compressed, while in the latter, they must be the first to recover their natural shape on account of their superior elasticity. The following circumstance, which I have now and then observed, leads to the same conclusion. In cases where aegophony was very strongly marked in the zone formerly mentioned, and where auscultation of the respiration, percussion, and the general symptoms clearly indicated an effusion, I have remarked from day to day the following changes take place in respect of this sign, and precisely at the same moment that the other signs just enumerated gave evidence of the progressive absorption of the fluid: it had become less loud everywhere; it had lost three inches in extent, reckoning from above down-wards, in the interscapular region, and one inch on the side, and had entirely disappeared in front; while, on the other hand, it had become very distinct, though not loud, over the whole inferior parts of the side and back, where it did not exist at all on the preceding day. These changes, I think, indicated the recession of the fluid from the upper parts and its diminution in the lower. In fact, I am of opinion that this phenomenon only exists when the lung is enveloped with a thin layer of fluid; and that in the instances just mentioned it became perceptible on the lower parts of the chest, only because the quantity of this had diminished.

This opinion is further rendered probable by the fact of the respiration being always very distinct in the places where aegophony exists, while it is not observed at all or very feebly below these places; and, by the additional observation, that when the aegophony descends, as above mentioned, the respiration becomes stronger in the points which it leaves, and reappears in those which it now occupies. I have already stated that in cases of very copious effusion there is usually no aegophony, or if it exists at all, it is only near the roots of the lungs, a situation where the fluid is necessarily less than anywhere else.

It will be difficult to fix, more precisely than I have now endeavoured to do, the exact relation between the bronchi and the thoracic effusion which gives rise to aegophony. This will be the more difficult on account of the small number of cases that prove fatal during the existence of this phenomenon. When death occurs from pleurisy, the effusion is generally very abundant, and aegophony has, therefore, disappeared. In looking for assistance from morbid anatomy, in this instance, we are, therefore, reduced to the very small number of cases that prove fatal from some concomitant disease, at the very time when the patients happened to be affected with pleurisy in that stage wherein aegophony exists.

I made an experiment with the view to ascertain the effect of an interposed fluid in modifying the voice to the character it possesses in aegophony, by applying a

bladder, half filled with water, between the scapulae of a young man who presented a well-marked natural bronchophony in this point. In this case it appeared to myself and several persons present that the voice, as transmitted through the liquid, became more acute, and also slightly tremulous, although less decidedly so than in real aegophony. The same experiment tried over the larynx gives a similar result.

It seems probable that the compression of the bronchial tubes by the pleuritic effusion contributes a good deal to the production of this phenomenon; since this must bring them into a form analogous to the *reeds* of certain wind instruments, such as the oboe and bassoon, which have something of the *bleating* sound of aegophony. This alteration of form, however, will not of itself account for the phenomenon without the presence of fluid, else it would exist in cases of contraction of the chest subsequent to pleurisy, which is not a fact. It would also be found in many cases of phthisis, wherein tubercles frequently compress the bronchi in the most decided manner.

I think there are only three cases of pleurisy in which this phenomenon will not be observed; these are: (1) Where a very rapid and copious effusion has suddenly compressed the lung against the mediastinum; (2) where a former attack of the same disease has firmly attached the posterior parts of the lung to the pleura; and (3) where there is hardly any liquid extravasation, but the formation, simply, of false membranes. This last case is very rare; and, besides, I have found aegophony where not more than two or three ounces of fluid existed.

From the preceding observations I think we are entitled to conclude that aegophony is a favourable sign in pleurisy, as it seems uniformly to indicate a moderate degree of effusion. Its continuance for some time is a favourable omen, as showing that the effusion does not increase; if it continues as long as the fever, or longer, we may be assured that the disease will not become chronic, as this never happens except when the effusion is extremely abundant. I have frequently drawn this prognostic, and have never been deceived in it. In every case where I have seen acute pleurisy terminate in chronic this phenomenon has ceased, or been much lessened, previously to the decrease of the febrile symptoms.

Aegophony, like pectoriloquy, is sometimes suspended for a longer or shorter time, reappearing after the patient has coughed or expectorated. But this happens much less frequently in the case of the former, as might be expected from the comparatively small bronchial secretion in pleurisy.

Some physicians have lately fancied that they have met with aegophony in cases of simple peripneumony without any pleuritic effusion; but I have no doubt they mistook bronchophony for it. It must be admitted that the two phenomena are likely to be confounded; I shall, therefore, in this place, compare them with each other, as well as with pectoriloquy:

1. Pectoriloquy being, in the great majority of cases, owing to the presence of tuberculous excavations, is almost always met with in the upper lobes. In whatsoever part, however, it may exist, it will always be readily distinguished by the accompanying cavernous

rhonchus, respiration, and cough. In certain rare in-stances, namely, where the excavation is of a flattened shape with rather solid walls, pectoriloquy may assume something of the vibratory character of aegophony; but it will almost always be distinguished from it by the exact circumscription of the sound to a small space, by its situation, and by the consideration of the accompanying phenomena.

Bronchophony, being caused by the simple induration of the substance of the lungs, does not yield the clear transmission of the voice through the tube, except at the roots of the lungs. The sphere of this phenomenon is always over a certain extent, and no one small point can be said to be its exclusive site. The same is true of the respiration and cough; the former is frequently found to be *bronchial,* and the latter to give the *mucous rhonchus,* but they are diffused over a certain space, and not, like those which are observed in cases of pectoriloquy, confined within a circumscribed spot. Bronchophony is less readily suspended than pectoriloquy, but more frequently than aegophony, for obvious reasons, de-pending on the relative condition of the bronchial secretion in the diseases in which each especially occurs. Finally, the tone or key of the speaking trumpet completes the list of the distinctive characters of bronchophony.

True and simple aegophony is characterised by the harsh, tremulous, silvery tones of the voice which is commonly more acute than the natural voice of the patient, and seems to be quite superficial, and to float, as it were, on the surface of the lungs, instead of coming from the interior, like pectoriloquy and bronchophony. It seems, moreover, to be rather the echo of the voice, repeating the words or their final syllables, in a small sharp and tremulous key, than the voice itself. This character of aegophony is especially marked when it exists in the anterior and lateral parts of the chest; since between the scapulae and at their lower edge (to which situation, by the way, it is most commonly restricted) it is almost always conjoined with the natural bronchophony, rendered stronger by the compression of the lungs in that part. And it is here, in the space between the inner edge of the scapula and the spine, and in this part only, that we occasionally perceive the bleating aegophonic voice completely traversing the tube, with the most perfect resemblance of the squeaking of Punch. Aegophony and bronchophony are necessarily conjoined in cases of pleuro-peripneumony; and, indeed, pectoriloquy may co-exist with them when an abscess of the lung supervenes.

When I published the first edition of this work I was not quite sure that aegophony might not exist in simple peripneumony: farther experience, however, has completely convinced me that this cannot be the case. Whatever analogy there may be between this phenomenon and bronchophony, it is easy to distinguish them when they exist separately; and an experienced ear may recognise them, in most cases, when they co-exist in pleuroperipneumony. Certain cases, however, will always be doubtful; and when it is so, we must be contented with the portion that is certain. The following positions seemed proved: (1) That aegophony exists in simple pleurisy, and in no case with more decided characters; (2) that bronchophony exists frequently in peripneumony, and with features sufficiently well marked to distinguish it from aegophony; (3) that both these co-exist in certain cases of pleuro-peripneumony.

When we meet with cases where the results obtained from percussion and the auscultation of the respiration leave reason to doubt as to the existence of pleurisy or peripneumony, if we find aegophony very complete and little mixed with bronchophony, we may conclude that the disease is exclusively the former, or nearly so; and, on the other hand, if the bronchophony is strongly marked, and with merely a shade of the stuttering cracked note of aegophony, we may decide upon peripneumony being the chief disease, conjoined, probably, with a slight pleuritic effusion. We may even conclude against the existence of any effusion if the characteristics of aegophony are observed only at the inner border of the scapula.

I have dwelt the longer upon these distinctions because they form perhaps the most difficult point in auscultation, and particularly because aegophony is the only one among the stethoscopic signs whose value has been called in question by competent judges. Cases of simple peripneumony, in which aegophony was supposed to exist, have been communicated to me by several of my colleagues and by many pupils. All these, as far as I had the means of ascertaining, were examples of bronchophony mistaken for aegophony, or a mixture of the two. In like manner I am constantly meeting with cases in the hospital where the two phenomena are confounded by the pupils; but when I have pointed out the distinction between them, and they have acquired more experience, they hesitate only in cases which are really doubtful.

This fact may be explained on the principles of acoustics, and by a reference to certain musical instruments., AUTHOR.

2. This assertion may seem strange to the practitioners who employ only bleeding and blisters in those diseases, but will be confirmed by the young physicians and students who have attended my *clinique* since I have been in the habit of using tartar emetic in large doses., AUTHOR.

PRACTICAL ESSAY ON TYPHOUS FEVER

Nathan Smith, M. D.

Nathan Smith (1762-1829) was a New England physician and founder of the Dartmouth School of Medicine and co-founder of the Yale School of Medicine. His essay on typhus is considered one of the earliest recognizing typhoid fever in America. He knew it was a contagious disease and that it implied some immunity on those that suffered from it. He is know for treating Joseph Smith the Mormon Prophet due to typhoid complications. His essays on typhus were published under the monograph of E. Bliss and E. White in 1824. (White 2009)

TYPHUS is a word of Greek derivation, which signifies *smothered fire,* or *stupor.* As applied to disease, it is doubtful whether it was originally meant to indicate internal heat, or whether it was used to denote a fever particularly affecting the mind, and producing stupor and coma.

With regard to the history of this disease, we have no account of its first appearance; on the contrary, it is always spoken of by the older writers as an affection well known. And from the additional circumstance of its having received its name from the Greek physicians, it is probable that it has occasionally afflicted mankind from time immemorial.

From the descriptions given of it by European writers, there cannot be a doubt but that the disease called Typhous Fever in Europe and especially in England, is similar to the one known by the same name here.

I have not been able to ascertain with much certainty, at what period it made its appearance among the Europeans, who first emigrated to America. For an hundred and fifty years after their earliest establishment, there were few if any books on medical science published in this country, and no medical journals made their appearance till a still later date. Of course all we know of the diseases of that early period has been collected from historical records, which casually mention times of sickness, but give us no descriptions, or at most imperfect ones, of their appearances and symptoms.

We have reason to believe, however, from these imperfect and broken accounts, and from oral tradition, that it was not long after the first settlement of the country, before the inhabitants were afflicted with what is now called Typhus, but which was then known by the various names of long fever, slow fever, nervous fever, putrid fever, &c.

Whether the Typhous fever was originally a disease of this country, I have not been able to ascertain. But although I have made particular inquiries in various parts of the country, and especially near the borders of the Indian possessions, I have never found an instance of an aboriginal inhabitant having suffered from this disease.

I have likewise consulted several physicians, who have lived many years in the vicinity of Indian tribes, and who have often visited them in sickness; they have all informed me, that they have never seen a native attacked with Typhous Fever.

I do not think, however, that my inquiries have been sufficiently extensive, positively to warrant the conclusion, however probable it may seem, that Typhus has never made its appearance among them.

Whether this disease is of universal occurrence, or is confined to any particular climate or latitude, as has sometimes been suggested, is a question which I am not prepared to decide; but I have every reason to believe, that it has prevailed in every part of the United States.

A late writer in one of our periodical journals, has advanced the opinion, that Typhus does not prevail in the warm season of temper-ate climates. This conjecture is unfounded, as I have seen it attended with all its characteristic marks in every month, and, I believe I may say with truth, in every day of the year. This fact might be attested by the whole medical faculty of New England.

With regard to the liability of the two sexes, I am disposed to think there is not much difference in the number of each attacked, but more females are cut off by it than males, in consequence of its appearance during pregnancy and soon after parturition.

As to age, I have never seen a child nursed at the breast affected with it, but other physicians have; and those in whom I could place confidence have assured me that they have met with infants suffering under this disease; and if so, it may be said to attack both sexes and all ages, from the cradle to the grave.

Notwithstanding its general occurrence throughout the country, long periods of time have elapsed, in which it has not existed in particular sections of country of considerable extent.

When I commenced the practice of physic in 1787, in Cornish, N. H., a town situated on the banks of the Connecticut river, I was informed by physicians, as well as the inhabitants who had resided many years in that part of the country, that about twenty years previous, a fever, which they had called *nervous,* had prevailed in that vicinity, had soon after disappeared, and, for the twenty years next succeeding, had not returned in a solitary instance. It was eight years after, during which time I visited the sick pretty extensively in that and the adjacent towns, before I saw or heard of a single case of Typhous Fever. I was then called into a family, one member of which had died of this disease, and another then lay sick of it. Soon after, I left this portion of country, and was absent for about eighteen months, and was in consequence unable to trace the course of the disease; but in 1798, a year after my return, it made its appearance in the village surrounding Dartmouth College, twenty miles distant from Cornish, and in several neighbouring towns simultaneously. From that time to

the present, a lapse of more than twenty-five years, I have never so far lost sight of the disease, as to be unable to follow its changes from one place to another, and to tell where it was prevailing.

During this same period, it has appeared in all the New England states, and as far west as my knowledge extends. Indeed it seems to possess a migratory character, and travels from place to place, and, after remaining in one village for a longer or shorter time, as, from one year to two or three, it ceases and appears in another.

I have not observed that situation has any influence either in producing or preventing this disease. It affects alike persons living on mountains and in valleys, or plains and the banks of rivers, and on the borders of lakes and stagnant ponds.

And I have not perceived that occupation or habits of life make any difference in their liability to receive this disease, nor has it in this country been confined to the poor and filthy; but affects nearly alike the rich, the poor and middle classes.

That the Typhous Fever is contagious,' is a fact so evident to those who have seen much of the disease, and who have paid attention to the subject, that I should have spared myself the trouble of saying anything with regard to it, did I not know that there are some physicians in this country, who still dispute the point; one, which I think can be as fully demonstrated, as that the measles, small-pox, and other diseases universally allowed to be contagious, are so.

The arguments usually brought against this opinion are, that in certain cases, we cannot trace the contagion to its source, and that many persons exposed to it, do not contract the disease. These objections might be advanced with equal truth against the contagiousness of all diseases; as it frequently happens, that one or more individuals in a family will escape an attack, though equally exposed as those who suffer from it.

A few instances, which have fallen under my own observation, would alone be sufficient to determine the question.

A young man, a pupil of mine, was attacked with the Typhous Fever, from which he recovered with difficulty. Some of his family, who lived about forty miles distant, came and took care of him during his sickness. Upon his recovery, they returned home in good health, but soon after sickened with the same disease, and communicated it to others, who had not been exposed in the first instance. From this, it spread to numerous other families in the vicinity, who had been exposed to the contagion. In the whole town where this occurred, there had been no case of Typhous Fever for many years, till brought there by circumstances above related.

During the prevalence of the Typhous Fever in Thetford, (Vt.) a woman went there from Chelsea, about ten miles distant, to visit and administer to a sister sick of this disease. Upon her return, she was herself attacked by it and soon after died. Others of her family contracted it of her; and in about four weeks, there were thirty persons taken down with Typhus, all of whom had been exposed to the contagion.

A young man belonging to Plainfield, (N. H.) who had left his friends, and resided for some time in the western part of the state of New York, returned to his father, who had a numerous family. He found himself unwell before he reached home was immediately

confined with Typhus, and soon sunk under the disease. In about four weeks after, I was called into the family, and found nine members of it sick of the same fever.

With a knowledge of these facts, and many more, equally to the point, it is impossible for me not to believe this fever contagious, though it may not perhaps be so certainly and readily communicated as some other contagious diseases.

Some physicians admit that Typhous Fever is often communicated from one person to another, who nevertheless suppose that it is frequently produced without any contagion or specific cause; that is, that it arises in many cases from errors in diet or exercise, from the effects of temperature, or what Sydenham would call an epidemic state of the atmosphere, from marsh miasmata, or confinement in close and crowded apartments. This is a difficult subject, and it is not easy to demonstrate that it is never produced by some or all of these causes, and perhaps the circumstance of analogy is all that can be adduced against the assumption.

However, the fact already noticed, of the absence of Typhus in a large section of country, for an interval of more than twenty years, would lead us to doubt the possibility of its being produced by any of the accidental causes above enumerated; for in such an extent, and among so many people, it is impossible but that some of these circumstances should have occurred and the disease of course be produced. Besides, if it can be communicated from one person to another, it has a specific cause, and I know no disease that arises from a specific cause, that can be produced without the agency of that cause.

It has been suggested that Typhus occasionally arises from marsh miasmata,[2] the same which under certain circumstances, produce intermitting and remitting fevers. A fact, which I shall here adduce, is strongly opposed to this hypothesis. On the Connecticut river, from Northampton, in Massachusetts, to its source, a distance of more than two hundred miles from north to south, and on all its tributary streams, on both sides, for an hundred miles in width; there has been no instance of any person's having contracted the intermitting fever, from the first settlement of the country to the present time; and yet the Typhous Fever has prevailed more or less in every township within that tract of country.

The Typhous Fever, as far as my experience, which has been considerable, enables me to judge, is a disease *sui generis,* exhibiting as little variety in the different individuals affected by it, as some of the diseases which are acknowledged always to arise from contagion. If its duration is not so uniform as some of the contagious diseases, it is less irregular than others, which spring from specific causes, as for instance the intermitting fever.

There is another marked point of analogy between Typhus and the common contagious maladies, which is, that it rarely affects the same individual twice. Those, however, who do not consider it a distant disease, but only a state of fever, will probably differ from me in opinion on this point. For it is evident, that if we make the name of the disease depend on the presence of one or two symptoms, or on that indefinite thing or state called debility, we shall be liable to misname it, and that this is actually done,

and in very many instances, there can be no doubt. Indeed, within the last year I have been consulted in several cases of disordered secretions of the digestive organs,' which were called low nervous or low typhous fever, merely on account of the presence of a furred tongue, loss of appetite, and some degree of thirst. Several of these patients told me, that they had had one of those "low fevers" every year, for several years in succession. It is obvious that those physicians who have such vague and indefinite notions of fever, as to call a stomach affection, Typhus, would be equally liable to call other febrile complaints by the same name, and may imagine they detect its existence in the same individual many times.

My own personal experience is strongly in favour of the opinion I have advanced of the non-liability of the same individual, to a second attack of Typhus; for during the twenty-five years since I first attended patients in this disease, and in that time I have visited many hundreds, and have witnessed its prevalence several times in the same village, I have never known nor heard of its recurrence in the same person.

I once attended a numerous family, every member of which was sick of Typhus, except two, who escaped at that time; but two years afterwards, when the disease again appeared in that neighbourhood, those two individuals of the family, and those alone, were attacked.

In another family, which I attended, consisting of eight persons, five of the eight had the disease during the autumn, and early part of the winter, and recovered. The next summer, the remaining three and another person, who had been added to the family after the former sickness, were attacked by it, while all those previously affected escaped.

The experience above spoken of, in addition to these cases, and numerous others equally in point, forms a strong presumptive proof, that in this respect, there is an analogy between Typhus and the common contagious diseases.

Some later writers, have described a fever beginning inflammatory, and ending typhous, and vice versa. Upon this point, I would observe, that in many if not all acute diseases, there is a marked difference in appearance between the rise and decline of the same disease, whether it terminates in death or recovery, and generally, the early part of all febrile affections is attended with more symptoms of inflammation than the latter. This is undoubtedly the case with Typhus; but such difference of symptoms in its different stages, should not induce us to give the disease different names.

As I consider Typhous Fever as arising from a specific cause, if it begins Typhous, or arises from such specific cause, I believe it to continue Typhous through its whole course. Variations, in severity or mildness, can make no specific difference in the disease.

With regard to the combination of Typhous fever with other diseases, the opinion has been often, and confidently advanced, that two diseases arising from specific causes could not exist in the same individual, at the same time. But however dogmatically it has been stated, it is nevertheless without foundation, since I have myself seen the Hooping-Cough, and the most malignant dysentery coexisting in the same person.` It has been stated by Mr. Harty,[5] that Dysentery and Typhous Fever often combine, and I can add my testimony to the same fact, for I have often seen a patient taken sick with

all the characteristic marks of Dysentery, and after some time the dysenteric symptoms have wholly subsided, while those of Typhus have continued for many days, so strongly marked as to leave no doubt on my mind of the truth of Mr. Harry's position.

I have likewise often seen this disease attack persons under the influence of epidemic catarrh, and the symptoms of both diseases continue perfectly evident for some time.

From the view of this subject above taken, and the facts there stated, I consider Typhous Fever a disease *sui generis,* arising from a specific cause, and that cause contagion, and seldom affecting the same person more than once.

The diseases with which it is liable to be confounded, and for which it is often mistaken, are pure unmixed catarrhal fever, the acute stomach complaints above referred to, and those bilious affections, which take place in the latter part of summer, and the commencement of autumn.

I have seen many cases of all these affections, which have been considered and treated as Typhus, by those who consider it as a mere state of fever, and not as a distinct disease, dependent on a specific cause.

It will be observed, that simple inflammatory fever is not mentioned as one of the diseases with which it may be confounded. The reason is, that no such disease has ever fallen under my observation.

Although I have practised physic and surgery for thirty-five years pretty extensively in all the New England States, except Rhode-Island, and have lived in New-Hampshire, Vermont, Connecticut and Maine, I have never witnessed a single case of continued fever, except Typhus, which was not either the effect of contagion, as the small-pox, measles &c. or evidently connected with local inflammation, and dependent upon it.

I do not mean to assert that Typhus is never connected with local inflammation; indeed I know that the reverse of this has been the opinion of some men of great observation, and that there are many phenomena, which serve to corroborate it; but if so, it differs essentially from that kind of sympathetic fever, attendant on phlegmonic inflammation, and on attentive examination, this difference will be sufficiently obvious.

Typhus, like the other contagious diseases, has a natural termination, and if it does not end fatally when uninterfered with, it gradually exhausts itself and disappears; at the same time, unlike those diseases, it is not restricted in its duration to so narrow limits.

So far as I have observed, it has rarely terminated under fourteen days from its commencement, and seldom exceeds sixty. In a few rare instances, it may have terminated earlier or continued later. In one case I visited, the patient had been confined an hundred days, and the symptoms still resembled Typhus, but the specific character had probably been changed, and these symptoms were rather the effect of the disease, than an evidence of its then actual existence.

With regard to the remote and proximate causes of this fever, which have been so often and diffusely described by the learned, if the remark made above be correct, contagion may be considered as the antecedent to all which follows its application, and that without it, no effect would be produced. But how this cause operates upon

the system, or on what part it makes its first impression, or how this first impression produces the ultimate effects, we are wholly ignorant. As for the proximate cause I know not how to separate it from the disease itself. Since the disease is known only by the phenomena it exhibits, these phenomena may be considered as constituting the disease, or all we know of it.

According to our late nosological arrangements, the Pyrexis, or febrile diseases, affect principally the circulatory system; if so, the affections of the other functions, are the consequence of the change first induced in this system. But as all the different parts of this system, are destined to perform different functions, it may happen that a disease may primarily affect one part only, and the change produced in the rest of that system, may be the consequence of a change produced primarily, in another part.

In the sanguiferous system, the proper function of the heart seems to be nothing more than to receive the blood from the veins, and throw it into the arteries, which may be considered as living canals, intended to convey the blood from the heart to the system of capillaries. Here all the functions belonging to this system are performed, such as nutrition, reparation of the body, absorption, secretion and the production of animal heat. Of course, the functions of the heart and great arteries must be considered wholly subservient to those of the capillaries, which in reality, perform all the great and essential offices of the circulating system.

As this fever is supposed to make considerable change in the action of the circulating system; the question presents itself, what part is first affected? does the increased action of the heart and great arteries, cause the increased action in the capillaries, or *vice versa?*

In cases of local inflammation, which produce symptomatic fever, it appears very evident that the capillaries are first affected; the action of the heart and great arteries is not changed till symptomatic fever is produced; and that this symptomatic fever, seems to commence in the capillaries, is evinced by the paleness of the skin, and the chills with which its first appearance is accompanied.

The analogy between the inflammatory and febrile action is so great, that we may with confidence rely on the similarity of cause.

The paleness of the skin, and the sense of cold spoken of above, which attend inflammation, and precede the attack of fever, or the development of those phenomena to which we usually apply the name, and which is followed by an increase of the action of the heart and arteries, I explain in the following manner. Before the diseased action can take possession of the capillary vessels, the natural and healthy one must cease, unless disease is a mere increase of the healthy action, which we have abundant reason to believe is not the case. It is during this interim, that is, between the interruption of the natural healthy action, and the complete establishment of the diseased one, that the patient feels the chill.

Something of this kind is observed in cases of local inflammation, which still continues to extend itself. A few lines beyond the discoloured part of the skin, between that and the portion which still retains its natural tint, there is a pale circle, evidently showing that the action of the capillaries in that part is suspended.

When local inflammation proceeds so far as to produce symptomatic fever, a degree of paleness accompanied by chills, precedes the increase of heat.

Upon the whole, whether we consider Typhous Fever as dependent on local inflammation or not, it is probable, nay, it is very certain, that like all other febrile diseases, the morbid action commences and continues principally in the capillary system, and that the change which we perceive in the action of the heart and great arteries, is symptomatic of the disease existing in that system.

The most violent affections of the heart and large arteries, as in palpitation, do not produce the slightest symptoms of fever, which serves to show that these two parts of the circulating system have diseases as distinct and different from each other, as their functions.

The symptoms of this disease, may be divided into such as affect the functions of animal life, and those of organic life.

The changes produced in animal life, may be referred to affections of the mind, of the organs of sense, sensibility and voluntary motion.

Those occurring in organic life, to changes produced in the respiratory, circulatory and digestive systems, to secretion and excretion generally, together with its effects on the animal heat.

Amongst the earliest symptoms belonging to the first class, are dull, aching pains in the head, back and limbs, usually commencing in the head and back, but in some cases in the lower extremities, attended generally with a sense of lassitude and fatigue. The patient's flesh, as they often express it, is very sore.

The symptoms, as they appear in the nervous system, are a disinclination to make any mental exertion, forgetfulness, inability to measure time, total incapacity to pursue any train of thought, or to attend to business. As the disease advances, delirium often makes its appearance, sometimes continuing day and night, at others, it is present in the night only. In a still more advanced stage coma supervenes, but not often so profound that the patient cannot be roused from it by speaking loud to him, although upon ceasing to speak he immediately falls back into the same state.

In a few instances I have known patients in their delirium impressed with an idea of some persons having abused them; and this idea has continued till after they have recovered, and even then obliterated with difficulty.

In two cases which I have met with, instead of delirium, a kind of insanity appeared pretty early in the disease; and in both, as the insanity came on, the peculiar symptoms of Typhus abated.

In one instance it was of a playful childish nature, in the other there was a display of great wit and humour.

In both it continued about four weeks, and as it then gradually subsided, a restoration of health took place.

There is in this disease not only a forgetfulness of the lapse of time and of occurrences that have recently happened, but though the patient appears sensible, and gives rational answers through the whole course of the disease; yet after his recovery, the

whole time elapsed, and all the circumstances that have taken place during that period, are entirely blotted from the memory, and are never after recovered.

The hearing is often impaired almost from the commencement of the attack. Sometimes false hearing occurs, and the patient imagines he perceives voices and sounds when nothing of the kind exists.

The sense of vision is not so much impaired as that of hearing; and blindness, I believe, never occurs till near the point of dissolution. But false, double, and distorted vision sometimes arises.

To an observer, the eyes present a peculiarly heavy and languid appearance and are a little watery, but in the beginning of the disease, there is not much evidence of inflammation. The red vessels however on the conjunctiva are often a little enlarged, and appear more numerous than in a state of health. In the latter stage they become more turgid and of a darker colour.

The secretions of the mucous membrane of the eye are often considerably affected, become thick and viscid, and accumulating in its angles, dry and put on the appearance of scabs.

There is sometimes a considerable increase of sensibility to light.

The voluntary motions are unsteady, the tongue trembles when an attempt is made to protrude it, and the patient[s] hand shakes when he attempts to bring it to his head. There is often more or less starting of the tendons, and the muscles of the face are agitated, especially when asleep, so as to produce momentary distortion.

The voice is altered, from the beginning. Early in the disease it is usually rather plaintive and small, but as it advances, and more particularly in bad cases, it becomes guttural, and at last truly sepulchral.

The patient is generally inclined to lie on his back, and he insensibly slides down toward the foot of the bed.

It has appeared to me in some instances that the moral principle has been affected. One patient in particular, who had been extremely sick with this disease, after his recovery had a strong propensity to steal, and did in effect take some articles of clothing from a young man to whom he was under great obligations for the care he had taken of him during his sickness. He at length stole a horse and some money, was detected, and punished. I took some pains to inquire into the young man's former character, and found it good, and that his family were respectable.

The symptoms of Typhus indicating a disturbance of the functions of the circulatory system are an increased frequency of the pulse, without fulness, or usually any considerable degree of hardness, from the commencement of the disease.

The pulse is generally rather easily compressed, and when the disease is severe, has often a peculiar, undulating stroke or a second small beat following each full one.

The animal heat is always deranged in this disease. In the commencement, there is generally some degree of chilliness felt by the patient, although his skin feels warm to the touch. This sense of cold often continues at intervals for three or four days.

The heat on the surface of the body varies in intensity at different times of the day, and is greatest during the exacerbations, of which there are generally two in the course

of twenty-four hours. They do not however appear regularly at the same hour each day, but vary both in the times of their appearance and in their severity.

In the commencement of the disease the most marked exacerbation occurs oftenest in the evening.

The heat is ordinarily very unequally diffused over the body; sometimes the head and trunk will be excessively hot, while theextremities are cooler than natural; at others, the extremities will be preternaturally hot, when the body is but moderately so. One cheek will often appear a deep red colour and be very hot, while the other remains pale and cool; as its colour and heat subside, they seem to cross over and affect the opposite cheek in the same manner. This colour and heat usually extend so far as to include the ear of the affected side.

Haemorrhage is not an uncommon symptom in this disease. In a majority of instances in which it takes place, it arises from the intestines, not unfrequently from the nose, and more rarely from the kidneys.

In females of adult years it is often from the uterus.

This symptom is most apt to show itself at about the height of the fever.

Livid spots occasionally appear on the skin, and blistered surfaces sometimes become black and gangrenous.

The effect of Typhous Fever on the secretions is sudden and universal; they are all changed either in quantity or quality from the very commencement.

The saliva is generally diminished in quantity, becomes glutinous and produces great thirst; but in some cases its secretion is augmented and the patient spits great quantities of frothy mucus, without any desire to take liquids as in the other case.

The tongue in the commencement of this fever is covered with a white fur, which as the disease advances assumes a yellow tinge, and from that gradually changes to a brown, which eventually becomes almost black. Arrived at this state, it cracks and peels off, leaving the tongue smooth, dry and very red. It is then again renewed and again comes off, making these changes, in severe cases, several times in the course of the disease.

The teeth are often incrusted with a brownish matter, which adheres to them closely near the gums.

The fauces are covered with a thick tough mucus, which is some-times thrown off in large quantities.

The urine is changed both in quantity and quality. In the commencement of the fever it is not high-coloured and is considerably copious, being often above the natural quantity, and deposits no sediment. In voiding it into a vessel it often foams like a new beer. As the disease advances, the urine becomes more highly coloured, and as it begins to decline, lets fall an abundant sediment. In very severe cases, the patient evacuates his bladder but seldom, allowing the urine to accumulate there in very large quantities.

The changes produced in the functions of the digestive apparatus are a vitiated taste, want of all appetite and desire for food, and a total loss of the power of digestion in the stomach. Sometimes nausea and vomiting take place; whether this last is spontaneous

or produced by art, the matter discharged shows, that the secretions of the stomach are entirely changed.

Sometimes the matter thrown up consists wholly of vitiated mucus, at others, it is mixed with bile of an unhealthy colour and consistence.

The peristaltic action of the intestines is sometimes suspended and at others preternaturally increased, and whether the stools appear naturally or are solicited by art, they are always liquid, generally of a dark colour and have an unnatural and excessively fetid odour.

The latter stage of all severe cases of Typhus is attended with diarrhoea; the stools are frequent, copious, liquid and extremely fetid. The bowels are often tympanitic, the flatus not passing off with the liquid stools.

The danger of the disease is in proportion to the violence of the diarrhoea; when the patient has not more than four or five liquid stools in the twenty-four hours, it is not alarming, as it does not seem to weaken him much, but if they exceed that number, serious consequences may be apprehended.

I have never lost a patient, whose bowels continued constipated through the whole course of the disease, and have never known a fatal case of Typhus, unattended by diarrhoea.

The respiration is always affected in a greater or less degree. There is generally a correspondence between the state of the respiration and that of the pulse, which is frequent and undulatory, when the breathing is hurried and unequal, or accompanied, as it frequently is, by occasional long and full inspirations like sighing.

After the patient has been sometime sick, if the disease proves severe, there is a peculiar whistling sound produced when he breathes through the nose, and when asleep or lying in a state of coma, the mouth is generally kept open and the breathing has some-what of a stertorous sound.

In some instances, there is no sensible perspiration for several days succeeding the attack of the disease, in others, there will be more or less sweating about the head, face and superior part of the body, while the other parts remain dry and hot.

Occasionally, the patient will sweat, during a part of the twenty-four hours, almost from the beginning of the fever.

In fatal cases there sometimes appears, what has been called the *washer-woman*[s] *sweat,* which is extremely profuse over the whole surface of the body and extremities, standing in large drops on the face, and giving to the cuticle, on the palms of the hands and soles of the feet, a corrugated appearance and a light colour, as if it had been long macerated in water. In such cases, the perspiration is warm till a short time before the patient expires. I have never seen an instance of recovery after this kind of sweating.

After the fever begins to decline, the perspiration becomes universal, especially while the patient sleeps; in this case it is not very profuse and produces a cooling and not unpleasant effect.

The skin has a peculiarly dirty appearance, and feels harsh and dry except when covered with perspiration. In some instances the surface of the patient's body communicates to

the touch a sense of scalding, or a certain kind of pungency, which is difficult to describe, but, when we are accustomed to it, readily distinguished from the sensation given in any other fever, which would perhaps equally affect the thermometer.

In the advanced stage, it is not uncommon for boils to appear; if they have a bright red colour and proceed to suppuration, it is a favourable symptom. Sometimes there appear eruptions about the mouth, these are considered by most physicians as a good indication, and I think I have generally found them so.

There is a remarkable odour arising from a person affected by this disease, so peculiar that I feel assured that upon entering a room, blindfolded, where a person had been confined for any length of time, I should be able to distinguish it from all other febrile affections. This is an additional circumstance in favour of the existence of the specific cause assigned above; as several other diseases which arise from contagion are attended by an odour peculiar to each, which, when once fixed in the mind, enables a person to recognise their presence ever after. This is strongly evinced in small-pox, measles, malignant sore throat, &c.

The absorbent system is perhaps less affected than any other, in consequence emaciation takes place rapidly. This is rather a good symptom, for I have observed that patients who emaciate rapidly are more likely to recover, than when they retain their ordinary degree of fatness, or when the face appears full and bloated. This last symptom, occurring after the disease has existed some days, indicates great danger.

In some instances, the power of absorption in one of the lower extremeties is in a degree lost, and one leg and thigh become enlarged. As the fever abates, the cellular substance appears to be loaded, the muscular power is weakened, and the limb feels heavy and unwieldly.

In some cases, it is eventually restored, in others, the enlargement continues through life.

After the fever has subsided entirely and the appetite is perfectly restored, the patient generally gains flesh very fast, and often ac-quires a greater size and weight than he possessed before the attack.

This increase in size takes place much earlier and more rapidly than the acquirement of muscular strength.

In cases where the disease had been very severe and the patient has recovered, the hair comes off the head, and is succeeded by a new growth; this happens more frequently with those who have much and long hair. The new hair, however, never acquires so great a length as the old.

After a very severe attack, the cuticle peels off from the palms of the hands and soles of the feet, and sometimes from the whole surface of the body; as is perceived when the skin is rubbed by the hand when in a state of perspiration.

The cuticle never separates in this way till the diseased action diminishes and the patient begins to recover.

As it respects critical days, much has been said and written from the earliest physicians to the present time; for my own part, I have never been able to determine

that any exist, or if there are, they can be of no use, in a practical point of view, for two reasons; first, the disease attacks in such a gradual manner that we hardly know on what day to fix its commencement; and second, when it terminates favour-ably, it often happens that the patient remains a week or more in such a situation that the practioner is unable to decide, whether he is mending or failing.

If the pathology of Typhous Fever we have just laid down, be correct, if it arises from a specific cause and has a natural termination, it may be a question, how far we are to attempt a cure of it, or if we possess the power, whether we can with propriety cut it off in its commencement and by art prevent its running its course.

Physicians in this country are divided in opinion on the subject, some imagine they have often cured it immediately after its first attack, nipped it in the bud, as they say, while others of perhaps more experience will tell you they are not certain they have ever arrested this disease by medicine.

I confess the subject is a difficult one, and that it is next to impossible to demonstrate the truth of either the positive or negative side of the question, and as absolutely so to those who have already made up their opinions on the subject, as to that still larger class, who have yet to learn to doubt their own skill and mistrust the powers of medicine.

When a person is taken unwell, he has a pain in the head, takes medicine, and the next day recovers, if the attending physician is disposed to consider it a case of Typhous Fever, we can bring no testimony to prove that he would not have had the disease, had he not taken the remedy.

In such cases we can only make the truth probable, and what appears so to one, may not to another.

In the first place, Typhus in its commencement exhibits so many symptoms in common with other febrile affections, that it is not easy for any one, especially the unexperienced, to determine whether the disease is truly Typhous or not; even those, who hold to the opinion that they often cure it suddenly, have confessed to me that they cannot distinguish it from other febrile affections upon its first attack, and never positively, till the disease has, in a considerable degree, developed itself.

This confession is alone sufficient to render the correctness of their previous opinion doubtful.

Again, these very physicians, or at least a portion of them, have acknowledged that when the disease is fully formed, that is, when the patient has the Typhous Fever, it cannot with any certainty be interrupted or cut off, as they express it.

Besides, we have to oppose to the opinions of those, who think they often cure this disease in its commencement, the belief of others of quite as much experience, who think they have never interrupted its course in a single instance.

Indeed, I am myself of this latter opinion, for during the whole course of my practice I have never been satisfied that I have cut short a single case of Typhus, that I knew to be such; nor have I seen a solitary instance of its having terminated within fourteen days from its first attack.

Cases have occurred to me often where the distress and suffering of a patient have been alleviated in less than half the time; but the morbid action has not ceased, nor the healthy one of the secreting surfaces been established, and a natural appetite restored, within the time above-mentioned.

It does not follow, because we have no expectation of arresting the disease, that we are to neglect doing any thing. In cases of the other contagious diseases, which are destined to run a certain course, as the small-pox, we often prescribe early in the disease, and with evident good effect, but not with a view to stop or cut off the disorder; for whatever we do, we expect it will pass through all its regular stages, and our prescriptions are calculated only to render it milder and safer, and enable the patient to live through it.

With the same views, I prescribe for Typhus, both at its commencement and through the course of the disease; for Typhus has a natural termination like other diseases, which arise from specific causes.

On the other hand, it does not follow of course, that this disease in all cases requires remedies, or that a patient should necessarily take medicines because he has the disease. In other specific diseases, we proceed on the principle of witholding our remedies unless they are called for by particular circumstances, and thus many cases of measles, hooping-cough, and other contagious diseases go through their course to their natural termination without medicine.

In cases where the disease is going on regularly in its course, without any symptom denoting danger, and without any local distress, it is presumably that medicines, especially powerful ones, would be more likely to do harm than good. Although Typhous Fever is a more formidable disease than measles or hooping-cough, yet there are many mild cases, and in such cases, I apprehend that the use of powerful means, with a view of curing the disease, is liable to do great mischief.

I have seen many cases, where persons in the early stages of this disease were moping about, not very sick, but far from being well, who, upon taking a dose of tartrite of antimony with the intention of breaking up the disease, have been immediately confined to their beds.

In fact, I feel well convinced, that all powerful remedies or measures, adopted in the early stage of Typhous Fever are very liable to do harm, and that those patients, who are treated with them in the beginning, do not hold out so well in the latter stages of the disease.

If it is determined that something must be done at or about the commencement of the disease, the question is, what that something shall be, and the first thing usually suggested is bloodletting.

From the time Dr. Cullen published his "First lines of the theory and practice of Physick," till very lately, students were generally taught to believe, that Typhous Fever was produced by some weakening power, and was, in effect, a disease of debility.

Dr. John Brown enlarged upon this theory, and inculcated a notion in accordance with it, that it should be treated by the most powerful stimulants. He considered bleeding

and all other modes of depletion as highly reprehensible, because Typhus was placed at the lower end of his scale of diseases, that is, below the standard of health.

This theory was carried into practice by many, and those, who might not have been converts to Brown's peculiar doctrines, not having sagacity enough to perceive that this debility was the same thing as specific disease, were nevertheless cautious about bleeding in a fever, which they considered Typhus, or possessing what they called a Typhous type. The most approved English authors since Cullen have held this doctrine till within a few years.

Very lately several writers' have ventured to recommend bleeding in this disease.

Some of them have advised this practice in certain cases, where there appeared to be more than an ordinary degree of excitement in some particular organ, in the brain or lungs for example, while others have recommended it, simply because the disease was Typhus, without waiting for any particular symptom, or set of symptoms to indicate its necessity.

The practitioners of medicine in New England, have been divided on this subject; and while one part have become converts to the doctrine of blood-letting to a high degree in this affection, the other have condemned it *in toto,* and, as though opposition had produced a kind of reaction on their part, they have had recourse to the most powerful stimulants both internally and externally, such as opium, wine, alcohol, and the most acrid stimulants, as Cayenne pepper, arsenic, &c. Indeed, individuals of this latter class have carried their prejudices to such an extent, as even to boast of having made their patients swallow three pints of strong brandy, accompanied with large doses of laudanum and cantharides.

I have myself seen a written prescription, in which opium, wine, alcohol, cantharides and arsenic, were all directed to be taken several times in the course of twenty-four hours.

It is remarkable, that though the practice of these two sects, for such they seem to be, is as opposite as possible, each considering the other's mode of treatment as highly deleterious, yet all boast of success and enumerate various cases, which have fallen under their care, with scarcely the loss of a single patient, yet notwithstanding these two highly improved modes of treatment, it is a notorious fact, that Typhous Fever often proves fatal.

There are but two ways of accounting for the equal success of these two opposite modes of cure, for as far as I can judge there is not much difference in the success, which attends them, either the disease is not so much under the control of blood-letting as they would have us believe, or these two extremes produce about an equal degree of mischief; for it is not conceded, that if a patient does not require bleeding, he stands in need of opium, arsenic, cantharides, or alcohol.

It has been observed that in certain cases of Typhus, there is great pain accompanied with a sense of fullness in the head, and in other cases, the patient complains of severe suffering in the chest, which is increased by a full inspiration.

Under these circumstances, the loss of blood, to the amount of from twelve to sixteen ounces, often mitigates these troublesome symptoms, and probably may not only alleviate the patient's suffering, but may enable him to go through the disease with more safety.

So far as I can judge from my own experience, bleeding does not generally produce any considerable change in this disease; the pulse is not rendered slower by it, and after the faintness, if there is any produced by the operation, disappears, the heat is not perceptibly diminished.

In some cases, in which I have resorted to this expedient, I feel confident that the pulse became more frequent and the temperature of the body higher, in consequence of the loss of a pound of blood.

As haemorrhage sometimes makes its appearance in Typhous Fever, and generally at about the height of the disease; the advocates for indiscriminate bleeding have imagined that taking blood early in the disease will prevent its occurrence. Upon this subject little need, be said, since it is next to impossible to disprove the assertion; for my own part, I have never seen any evidence of its truth.

In the autumn of 1812, Professor Perkins, now of New York, and myself, attended between fifty and sixty cases of Typhus in the vicinity of Dartmouth College, and many of them students of that institution.

Of the whole number, which came under our care, only one was bled, and that on account of a sense of fulness in the head, of which he complained.

This patient had afterwards a haemorrhage from the bowels, which was pretty profuse, but he eventually recovered.

This symptom did not occur in any other of our patients, of whom we lost but one.

I am sensible that it is not safe to rely on one fact alone in making up an opinion on a practical subject. This case is mentioned only to show that bleeding does not always prevent haemorrhage; and from the success of our practice, it would seem that blood-letting is not so essential, as some would persuade us to believe.

That patients often recover from this disease after blood-letting has been practised is an unquestionable fact, and the inference which should perhaps be drawn from it, in conjunction with the facts mentioned above, is, that the loss of a moderate quantity of blood in Typhus, is not of itself dangerous, and in a majority of cases, may be allowed with impunity. There are cases however in which it may be essential to the patient^{s} safety, while in others it may prove highly injurious. The judgment and skill of the physician is necessary in each individual case to determine the propriety of its adoption, as well as the quantity which should be abstracted.

I have never seen any benefit from blood-letting in Typhous Fever, where there was no local inflammation or congestion, that particularly called for it.

The symptoms, which would induce me to bleed, are uncommon pain in the head, accompanied with great heat in that part, a sense of fulness, and a throbbing of the temporal arteries, or marks of congestion in the viscera of the thorax, such as pain in one or both sides of the chest, increased by a full inspiration.

The state of the pulse also should be considered before we bleed; a very frequent one does not indicate blood-letting, on the contrary, in such cases I have seldom or ever seen this evacuation attended with advantage.

Many of the French physicians prescribe leeches instead of general bleeding, and where they can be procured, the remedy may be tried with safety, as there is less to be apprehended from the loss of an equal quantity of blood by leeches than in any other way.

The blood, drawn in Typhus, seldom shows a buffy coat, and as far as I can judge, is found rather darker coloured than in ordinary cases of active inflammation.

Emetics and evacuants from the stomach and bowels are generally prescribed after the question of the propriety of blood-letting has been decided.

From what has been said on the subject of attempting to interrupt or arrest Typhous Fever, it will be readily understood, that I do not deem it necessary in every case to give either emetics or cathartics; but as these remedies are often necessary, it is important that we should point out, if possible, the circumstances which demand their use.

In cases of simple mild Typhus, where there is no nausea at the stomach, no pain in that region, where the heat is moderate, and the pulse not greatly altered in frequency, I am clearly of opinion that we had better leave the disease to cure itself, as remedies, especially powerful ones, are more likely to do harm than good. In such cases, the patient gets along better without medicine than with; all that is required is to give him simple diluent drinks, a very small quantity of farinaceous food, and avoid as much as possible all causes of irritation.

The symptoms, which require the use of emetics, are nausea, sickness, and oppression at the stomach; and when required, it may be an important question what kind of emetic should be given.

The tartrite of antimony is an old remedy in the commencement of fevers, and when active inflammation exists, there is no one with which we are acquainted, that possesses so powerful an effect in suppressing it.

As some consider Typhous Fever a local inflammation, or an affection of the circulatory system dependent upon it, preparations of antimony would not seem inappropriate remedies. I will not take upon me to say that this fever is never connected with local inflammation, but if so, it is not with that kind which we generally denominate phlegmonic, or that, which tends to suppuration, nor that, which has been called sthenic, as is conclusively proved by the effects produced upon it by blood-letting, since this evacuation possesses a controlling influence over the one, while it has but a slight power over the other.

Though it may in certain cases obviate some of the troublesome symptoms of Typhus, and perhaps render the disease safer, yet it does not cure it, and in many cases is highly improper. So likewise, as far as I have been able to judge, tartar emetic should not be used in this affection, even at its commencement, and in the latter stages of the disease, it is sometimes followed by fatal consequences.

From the bad effects, which I have seen result from the use of antimony in this complaint, I have long since neglected it in my practice, and have substituted for it the ipecacuan, eupatorium, or the sulphate of zinc.

The use of this sort of medicines has generally been confined to the commencement of the disease, but they are frequently proper and useful in its later stages. The articles, which I have just mentioned, either simple or combined, may be given, with safety and often with advantage, at any period when the symptoms are such as to demand an emetic.

Cathartics are recommended in almost all febrile diseases, and in many cases, much dependence is deservedly placed upon them; their general use, however, should not be indiscriminately recommended. In this, as in similar cases, we should consider the necessity of their administration, and whether they would probably produce the de-sired effect, not neglecting the particular means to be employed, and the extent to which we consider ourselves justifiable in carrying those means.

There are no remedies capable of doing much good, which under certain circumstances and in certain doses may not do harm, and I am persuaded that powerful ones of this class are always injurious.

Costiveness often occurs in the commencement of this disease. This kind of costiveness, is however, of a very different character from that which is habitual with some individuals, and which we so often meet with in stomach and bowel complaints, where the stools are unfrequent and the faeces hard and indurated.

The stools in this disease, except at its commencement, when there is generally an accumulation in the great intestines, are always liquid and possess a peculiar colour and odour.

The costiveness, therefore, consists only in the unfrequency of the discharges, and not in their consistence.

If a strong drastic cathartic be administered, it is often followed by a diarrhoea, which, though not always injurious when moderate, is always liable to become so.

I have never known a patient to die of Typhus whose bowels were slow and required laxatives to move them, during the course of the disease. Laxatives therefore and not purges are required in this affection; and the milder they are, if they have the effect to excite the bowels to throw off their contents, the better, and even these should not be used too freely. If the bowels are shut up too long, their contents become offensive to the intestines, stimulate them violently and a diarrhoea is more likely to follow, than if the bowels had been excited by a gentle laxative.

Laying aside the strong purgative drugs, we have a considerable number of mild cathartic ones to select from; epsom salts with senna, rhubarb, alone or with a very small quantity of calomel or ipecacuan given in small and repeated doses, are amongst the best articles of this kind.

Blisters have long been employed in fevers under the general impression that they were useful, without any very definite notion of the mode by which they produce a good effect, and without waiting for any particular symptoms indicating their use.

So far as my experience extends, they do not produce any very considerable influence on the disease; like bleeding, they will some-times relieve local pains, when applied near the part affected, as on the forehead or back of the neck when there is pain in the head on the breast, when the chest is affected.

In most cases if they do no good, they produce no bad effect; but when there are petechiae, or a disposition, to haemorrhage, indicating great debility in the system of capillary vessels, they are liable to do harm, for in such cases, the blistered surface often becomes black and gangrenous.

Upon the whole, we cannot consider blisters as possessing much influence in Typhous Fever, and they may in most cases be dispensed with.

With regard to the perspiration, there can be no doubt, but that a great quantity of aqueous fluid escapes from the body in the form of vapour in Typhous Fever; but it does not become so condensed, during the hot stage, as to show itself in the form of a liquid on the skin, till there is some abatement of heat on the surface.

As there is more or less of sweating in the decline of most febrile diseases, and as a general perspiration is often accompanied with other symptoms of amendment, it has been looked upon as the natural cure of the disease. Upon this impression, it has been a pretty universal practice to encourage sweating; but with respect to the grounds upon which this practice is founded, it is a question, whether the effect has not, in this case, been mistaken for the cause; that is, whether the sweating is not the effect of the amendment, rather than the cause of it; and if so, it is still more questionable, whether sweating, produced by art in the beginning of the disease, would be attended with good effects.

In all cases, where I have seen this sweating regimen adopted, especially when much external heat has been applied, the practice has been obviously injurious.

There are some medicines in the class of diaphoretics, which may be given with impunity, such as the ipecacuan, contrayerva, and the Virginian and Seneca snake roots, though they seldom or ever pro-duce any sensible perspiration till the disease has formed a crisis, and then the patient will perspire freely without their assistance. When stimulating remedies are given internally and heat applied externally, to force a sweat, as it is called, the consequences are always bad at any period of the disease.

Opium in some form or other is often used in Typhus, and in many instances and under certain circumstances, may be useful, but is by no means an universal remedy, nor can it be administered with impunity in every stage of the disease.

When the patient is hot and suffers from pain in the head, and throbbing of the temporal arteries accompanied with confusion of mind, opium is generally hurtful and seems to augment rather than diminish these troublesome symptoms. But after their violence is in some degree abated, and the heat has become moderate, it may be used, and when combined with ipecacuan, sometimes gives rest and quietness during the night; although in many cases it will have the opposite effect; and serve to make the patient more watchful and restless. Under such circumstances, if persisted in, it does harm.

When diarrhoea occurs, opium combined with ipecacuan and camphor, is generally useful; and if it does not succeed in checking the discharge, does not appear to produce an injurious effect.

The use of this drug has also been advised in cases of great prostration of strength, that is, in cases where the morbid action is kept up in kind but has abated in force,

owing to the exhaustion of the sensibility and irritability of the capillaries. In cases of this description it has been prescribed as a stimulus to support the patient, and in such instances it must be acknowledged, that it is sometimes used with apparent advantage. But under the same circumstances, it does not always agree with the patient; and sometimes instead of quieting and giving him ease, produces a contrary effect, rendering him restless and watchful, and not unfrequently brings on or increases delirium, especially if given in large doses.

Upon the whole, opium may be used to advantage under certain circumstances in Typhous Fever, but cannot be considered as a specific in any stage, and is at best but a doubtful remedy.

A few years since mercury was, by many physicians in this country, considered a specific in Typhus, and its influence over the disease explained upon the principle that two kinds of morbid action could not exist in the system at one and the same time, and it was supposed that giving mercury so as to excite its specific action on the mouth, was substituting the mercurial disease, which was of short duration and safe, for the more dangerous febrile disease called Typhus. This ingenious explanation appeared very well in theory; all that seemed necessary was, that the facts should be found corresponding. Had this desirable incident happened, we should have possessed a very easy and safe mode of curing this somewhat intractable disease, by simply putting our patient under a regular course of mercurial remedies so as to affect his mouth for a reasonable length of time. But unfortunately, we have as yet discovered no such sure and easy method of curing Typhous Fever.

It was always acknowledged by the advocates for this practice, that in some and very severe cases, and those in which medical aid was most necessary, the mercury would not have its usual effect, and ptyalism could not be produced, and it was further confessed that in such cases if the mercury was pushed to any considerable extent, it produced a very bad state of the mouth, occasionally terminating in gangrene of the gums.

I have had several cases of necrosis of the under jaw, where I was compelled to remove a considerable portion of that bone, which had died evidently in consequence of an inordinate use of mercury during this fever.

In other cases, where calomel has been used early in the disease, and the mouth has been as favourably affected as could be wished, the disease nevertheless has run on forty or fifty days, and sometimes terminated fatally at a very advanced period. In some instances, after the mercury has affected the mouth, there has been a copious discharge of tough, ropy mucus from this part, which has been kept up for a long time after the other specific effects of the remedy had ceased.

This vitiated discharge of saliva is often accompanied with a vitiated secretion of the gastric fluid, and attended with a total want of appetite, and a constant ejection of every thing taken into the stomach.

Such patients have frequently recovered with difficulty, eight or ten weeks after the commencement of the disease. I have been consulted in many cases of this description.

Upon the whole, mercury cannot be considered a specific in Typhus, but may be an useful auxiliary in certain cases, that is, the blue pill or a small portion of calomel, combined with some other medicine, may be used with advantage. A small quantity of calomel with opium has in some cases checked a colliquative diarrhoea; and a grain of the same, joined to five or six of rhubarb, has done very well as a laxative.

Those physicians who consider Typhus as a disease arising from debility, have highly extolled the virtues of the Peruvian bark, and some have employed it through the whole course of the disease, while others have restricted its use to its later stage.

It is not from ingenious reasoning or fine spun theories, that we should estimate the value of a remedy, but from the effects actually produced by it in the majority of cases. Judging in this way, this remedy cannot be allowed a very high place, since as was before observed, the physicians just mentioned, who treat this disease with tonics and stimulants, have not been remarkable for their success.

I have prescribed the cinchona in many cases, and as far as I am able to judge, when there was a considerable heat present and while the mouth was inclined to be parched and dry, and especially when there was pain in the head, its use was injurious. But in some cases, when there was a sense of coldness creeping over the patient and where there was haemorrhage, it produced a good effect.

Upon the whole, the bark like mercury may be an auxiliary but cannot be considered an important remedy, much less a specific.

Bitter infusions may be used through the whole course of the disease, such as the eupatorium, (perfoliatum,) chamomile, and various others. When taken in considerable quantities, though they do not cure the disease, they may assist in preserving the tone of the stomach in some degree, and in that way aid in conducting it to a favourable termination.

Some twenty-five years since, the alkalies were proposed as remedies in febrile diseases, and for a time were considerably used.

They were introduced on the supposition that they possessed antiseptic properties, but they have not fulfilled the expectations of those who introduced them; nevertheless, I have occasionally seen them produce a good effect. Fever does not prevent the fluids from becoming acid in the stomach, and where this happens the moderate use of the carbonate of soda or of potash removes the irritation and burning sensation in the stomach caused by the acid; and thus far they may serve as palliatives, but I could never perceive that they possessed any other power over this disease.

The alkaline carbonates given with some acid, so as to evolve carbonic acid gas in the stomach, are generally grateful to the patient, and perhaps sometimes useful.

Those physicians, who adopted the notion that alkalies were anti-septic, of course considered acids as septic, and proscribed their use; and there were not wanting instances of (p. 71) their disagreeing with the stomach, especially the vegetable acids.

We have already mentioned, that fever did not prevent the fluids from becoming acid in the stomach, and I have, in several cases, witnessed a sensation of burning accompanied with an indescribable feeling of distress in that organ coming on after

taking lemonade and other vegetable acids; but such cases are rare. In most instances, the vegetable acids, diluted with water, will be found grateful to the patient, and may, in almost all cases, be taken with impunity.

The mineral acids have been used as remedies in Typhous Fever, especially the muriatic and sulphuric. I have oftener prescribed the former than any of the others belonging to this class, and have thought the moderate use of it aided in preserving the powers of the stomach; but it is not a medicine upon which much dependence can be placed.

We were formerly taught to place some reliance on that class of medicines called refrigerants, viz, the acids and neutral salts. We have already had occasion to mention the acids, their refrigerating power is very trifling. As for the neutral salts, some of them may be used as cathartics in the early stage of the disease, when the heat of the body is considerable. The sulphate of magnesia, and the tartrite of potash are the best; but in the advanced stage of the disease, they sometimes produce an injurious effect on the stomach, and are apt to induce diarrhoea; this is more particularly the case with the sulphate soda.

Nitre, or the nitrate of potash, was formerly a favourite prescription in fevers of all kinds. When this article is given in very small doses, it produces no perceptible effect, and if given in large, it does a positive injury to the stomach.

All things considered, we can place no dependence on internal refrigerants, and if we wish to produce this effect, that is, if we desire to diminish the temperature of the body, when above the ordinary standard, we must have recourse to cold water or cold air.

The heat may be lessened by covering the patient lightly, and admitting cool air into the room, when the season of the year will admit of it, or by admitting the air in contact with the skin, by raising the bedclothes on one side of the bed, and bringing them down suddenly again; in this way we can cause a current of cool air to pass over the body, which will conduct off the heat and greatly refresh the patient.

But the most effectual method of reducing the temperature of the body is by the use of cold water, which may be taken internally, or applied externally. When persons, sick of this disease, desire cold water to drink, it should never be denied them, they should be allowed to drink *ad libitum*. The quantity of heat abstracted from the body by the water which they will drink, however, is but small, and except in cases where, by its influence on the stomach, it produces perspiration, its effects are very trifling.

The only effectual method of cooling the body, in these cases, is by the use of cold water applied externally; by this means we can lessen the heat to any degree we please. Different physicians have adopted different modes of making the application. Some advise to take a patient out of bed, pour buckets of water upon him and then replace him again; while others prefer sponging him with cold water. We have cases, where cold water would be of service, in which our patients are too much reduced to be taken out of bed and placed in a sitting posture without injury. In these cases a different management will be necessary. The method, which I have adopted, is to turn down the bedclothes and to dash from a pint to a gallon of cold water on the patient's head, face and body,

so as to wet both the bed and body linen thoroughly. It is better that he should lay on a straw bed when this is done, it is not however essential. If his body should be very hot, he may be turned upon his side, and the water dashed upon his back.

As soon as his linen and the bedclothes begin to dry, and the heat in the head and breast begins to return to the surface, the water should be again applied, and in this way the heat may be kept down to the natural standard or rather below, on the surface, so that the skin may feel rather cool to the hand of a healthy person.

It is not very material what the temperature of the water is, if it is below blood heat, excepting the shock given by its first contact, which in cases where there is much stupor or coma, is of some importance; in general, the effect is produced chiefly by the evaporation.

All additions made to water used for this purpose, such as vinegar, spirits, &c. are injurious. The former, on being evaporated on the surface of the body, covers it with a thin pellicle formed by the sediment, which makes the skin feel stiff and unpleasant, and spirits evaporated about a sick person produce an offensive odour and likewise leave some impurities on the skin and clothes.

When water is used to wash the body, as is often necessary in this fever, soap, or the carbonate of potash may be added, but when used to reduce the heat alone, pure water will be found best.

When the temperature of the body is such, that it does not require the general application of cold water, still it may be occasionally applied with advantage to the head and face.

Whenever there is any dryness of the lips, teeth or tongue, it may be relieved by letting water, slowly squeezed from a sponge or cloth, fall on the mouth and over the whole face; this should be repeated often enough to keep the mouth clean and moist.

I have produced a good effect by laying a piece of thin loose muslin over the face, so as to have the air drawn through it in the act of inspiration, at the same time keeping it constantly wet with cold water; in this way, the vapour inhaled into the lungs, proves very grateful to the patient.

I could state many cases in which cold water was applied with the most unequivocal advantage.

In the summer of 1798, the first year in which this fever occurred in my practice, T. B., a young man of about twenty-five years of age, was brought in to my neighbourhood sick of Typhus, for which he had been bled before I saw him; the fever was severe, and his unfavourable symptoms increased for several days. In a consultation, it was agreed to put him into a warm bath, which was done.

He was a little delirious before he went into the bath, and when he came out, was raving. From this state, he sunk, in the course of the next night, into a low mutting delirium, with a great degree of coma and starting of the tendons, and with scarcely the ability to swallow. His pulse was irregular, but still possessed some force, and his heat was above natural. Twenty-four hours were passed in this situation, without any symptoms of amendment. The next day when I visited him about nine o'clock in the

morning, the weather being very warm, (as it was in the month of July,) a young man, who had engaged to attend him that day, came in, bringing a gallon pitcher full of cold water, which he had just drawn. Finding the patient's pulse had some strength and his heat continued above natural, I stripped him naked as he lay on a straw mattress, and poured the gallon of water over him from head to foot. He seemed to feel the shock, but did not speak. The young man in attendance was ordered to repeat the affusion as often as he began to grow dry and warm, which was punctually performed.

When I visited him a little after sunset, his heat was diminished and his pulse did not intermit as often as it had done. He was then taken off the wet bed and laid on a dry one, likewise of straw, with nothing but a linen sheet spread over him, the windows of the chamber were kept open through the night and a dose of opium and musk was prescribed and taken. No other internal remedies were administered. The next morning there was no alteration. The affusion of cold water was renewed as the day grew warm and the heat was kept down through the day as it was the proceding one. Before night, the patient recovered so as to speak, called for more water, and said he wished to be put into the river. From this period he became convalescent, and recovered without the use of any other remedy.

In the month of September, of the year 1800, I visited A.P. a strong robust man, aged between thirty and forty years. He had been sick about a fortnight, his head was not much affected but the heat was great and his thirst urgent. My visit was in the evening. The body was stripped, that is, the sheet which was thrown over him was removed, and his shirt divided down before so as to expose his body, and about a quart of cold water was applied by sprinkling it on with the hand. The sheet was then thrown over him; and the water applied as often as he became dry and the heat began to return. A little peruvian bark, mixed with some nitrate of potash, was all the medicine taken. Previous to this he had drunk, every night, two quarts of some diluent drink, for several nights in succession. After the first application of the water, that parched sensation of the lips and mouth, which urged him to drink so much, abated, and he lay the whole night without any desire to drink. The next day he was convalescent, and recovered without medicine.

I. B. a strong robust man, aged between thirty and forty, had been sick a fortnight when I first visited him; his pulse was frequent, his heat great, and his mouth exceedingly parched, so much so that he could not sleep but for a very few minutes at a time without being awakened by a sense of thirst. His feet were very cold.

This individual had been badly treated, and his friends had been prevented from changing his linen and bedclothes by the physician, who had fears that he would take cold.

The patient was first shaved, an operation which had not been performed for something like a fortnight, he was then slipped down in the bed so as to drop his feet into a vessel of warm water and soap, where they were rubbed till they became clean and warm. The bed and body linen were then changed and he was properly placed in bed. The affusion of cold water was commenced over the head and breast, and repeated sufficiently often to keep down the heat. The distressing thirst was removed at once, he became convalescent the next day, and recovered without any further medical treatment.

I could detail a great many additional cases, where the good effects of cold water were as apparent and as immediate as in the cases just cited; and in no instance where I have used it, or seen it used by others, has it done harm. There are cases, however, where its application is not called for; at the same time there are but few in which it may not in some stage of the disease do good. It is always grateful when applied to the face and mouth, and its vapour is very salutary and refreshing to persons sick with fever.

It will be observed, that the first time I used cold water externally in fever, was in 1798, the first hint of which I took from Dr. Robert Jackson[s] work on the Fevers of warm climates.

With regard to diet, it is not necessary to say much; if patients were left to select for themselves, without the interference of nurses and friends, who are always afraid they will starve, they would generally decide right, since they would not often take anything, that could becalled food. The farinaceous and mucilaginous substances are the only articles of nutriment admissible, with the exception, perhaps, of milk largely diluted with water, or whey prepared from it.

All solid food is injurious, and all sorts of broths prepared from animal substances should be prohibited.

After the fever has formed a crisis, and the secretions of the mouth have become healthy, the appetite generally returns, and if we then allow the patient to choose for himself what he will eat, and take care that the quantity taken at first is very small, he will not often be injured by it. But it is not safe to let patients judge as to the quantity. Their minds are weak, and their appetites strong, and they would, if allowed, often hurt themselves by too much indulgence.

With respect to liquids, I have generally let the patient choose for himself, provided he does not select any of the stimulants, such as ardent spirits or strong beer, which, however, is almost never the case. Cold water, or water acidulated with one of the vegetable acids, small beer or brisk cider are the drinks which are usually preferred. The infusion of the pleasant aromatic herbs may be always allowed.

Besides giving directions for the use of medicines, it is important that we should direct, what may be called the general management of the patient.

When an individual is first taken sick with Typhous Fever, we should expect a disease of considerable length, and make our arrangements accordingly. If the thing is practicable, he should be kept in a spacious room, the larger the better. His bed should be of straw or husks, especially if it is in the warm season; and it should not be placed in the corner, but brought out into the room. We should contrive to have a current of air pass over the bed by means of doors and windows. It is well to have a chinmey and fireplace in the room, and in the night when the air is very still, (though the weather should be warm,) a small fire kindled with a little dry wood, so as to cause a current of air up chimney, and by that means often change the atmosphere of the room, will be found of service. In the warm season of the year, the windows should be kept open night and day. All the furniture should be removed, except such articles as are required for the patient's use. The windows should be darkened, or something opposed to the light, in

such a way as to still admit the air. The room should be kept as quiet as possible, since noise is injurious, and no more persons should be admitted than are necessary to take care of the patient, which will, if he is very sick, require the labour of more than one.

The room should not be carpeted, and the floor should be often washed with pure water, or soap and water, and in the hot season, it, as well as the walls, may be kept wet with water during the heat of the day.

Cleanliness is absolutely essential to the patient's comfort, and no dirty dishes or useless medicines or food should be suffered to remain in the room. All excrementitious matters should be removed immediately. In the warm season of the year, the bed and body linen should be changed every day, and in the cold, every other day at farthest.

The patient's body and limbs should be cleansed every day with a piece of sponge and warm water or soap and water. If a male, he should be shaved every day or every alternate day, and if a female with long thick hair, it should be cut off or thinned, so as to leave but little of it the full length.

NOTES

Without going into a discussion upon contagion and infection, I would observe, that by a contagious disease, I mean simply, one that can be communicated from one individual to another.

Good, Study of Medicine, Vol. II, p. 188.
"Acute disorder of the digestive organs" of Hall, On Diagnosis, part 2, p. 102.
Extract of a letter from Daniel Sheldon, M. D. of Litchfield, Conn.:

"In the course of the year 1807, the mumps, hooping cough and measles were all prevalent in this town, at the same time. The children of the Rev. Dan Huntington, then a resident here, were subject to these complaints. One of them had the mumps, hooping-cough and measles at the same time; another, the measles and one of the other complaints, which I do not now, accurately remember. In each child, the peculiar symptoms and appearances of each disease were exhibited and strongly marked; and, so far as I observed, progressed together, without any mitigation or suspensions of either. Each of the children, after the abatement of their disorders, had an inflammatory swelling about the neck, of considerable size, which suppurated and was opened."

Observations on Dysentery and its combinations, by William Harty, M.B. London, p. 57, et seq.

Happening in company with a physician with whom I was slightly acquainted, he observed that he had adopted a new method of treating Typhus, which I was aware had been prevalent in the vicinity where he lived, and stated that it had proved very successful. Upon my inquiring into his peculiar mode of treatment, he informed me that it consisted in giving his patient milk and water, and nothing else, through the whole course of the disease, and affirmed that he had treated quite a number of patients, and

had not lost a single one since he had adopted this mode of treatment. I take this to be a confirmation of my opinion, that powerful remedies are not properly used in this disease, unless called for by particular circumstances, and these circumstances are more rare than is generally supposed.

Armstrong, Pritchard, &c. &c.

AUSCULTATION OF SOUNDS NOT NECESSARILY ACCOMPANYING THE RESPIRATION AND VOICE

René-Théophile-Hyacinthe Laënnec

René-Théophile-Hyacinthe Laënnec (1781-1826) was the French physician responsible for the1816 invention of the revolutionary stethoscope and his 1819 essay on the principles of auscultation. He was able to recognize and describe almost every known physical finding associated with lung disease. His famous work was published as *De l'auscultation médiate, ou traité du diagnostic des maladies des poumons et du coeur, fondé principalement sur ce nouveau moyen d'exploration.* 2 volumes. Paris 1819 by Mériadec Laënnec. In 1823 he became a full member of the Académie de Médecine and professor at the medical clinic of the Charité, and in 1824 he was made a *chevalier* of the Legion of Honour. This same year he released this next essay as a follow up to the original. This 1824 work was included in the latter versions and translations published into the German and the French versions, and then into the English editions by Sir John Forbes. (White 2009)

Various sounds, foreign to the natural respiratory murmur or resonance of the voice, may arise within the chest from various accidental causes: I shall class these under two heads the *rhonchus and metallic tinkling.*

1. Of the different kinds of rhonchus

For want of a better or more generic term I use the word *Rhonchus* to express all the sounds, besides those of health, which the act of respiration gives rise to, from the passage of the air through fluids in the bronchi or lungs, or by its transmission through any of the air-passages partially contracted. These sounds likewise accompany the cough, and are made even more perceptible by it; but in most cases the auscultation of the respiration sufficies for their exploration. They are extremely various; and although they possess, in general, very striking characters, it becomes difficult so to describe them as to convey anything like a correct notion to those who have never heard them. Sensations, we know, can only be communicated to others by comparisons; and although those which I shall employ may seem to myself sufficiently exact, they may not be so to others. I expect, however, that my description will enable any observer of ordinary application to recognise them when he meets with them, as they are much more easily distinguished than described.

We can distinguish five principal kinds of rhonchi: (1) The moist crepitous rhonchus, or *crepitation; (2)* the mucous rhonchus, or *guggling; (3)* the dry sonorous rhonchus, or *snoring;* (4) the dry sibilous rhonchus, or *whistling; (5)* the dry crepitous rhonchus, with large bubbles, or *crackling.*

The moist crepitous rhonchus has evidently its site in the sub-stance of the lungs. It resembles the sound produced by the crepitation of salts in a vessel exposed to a gentle heat, or that produced by blowing into a dried bladder, or it is still more like that emitted by the healthy lungs when distended by air and compressed in the hand, only stronger. Besides the sound of crepitation, a sensation of humidity in the part is clearly convey-ed. We feel that the pulmonary cells contain a watery fluid as well as air, and that the intermixture of the two fluids produces bubbles of extreme minuteness.

This species of rhonchus is one of the most important, and, fortunately, it is most easily distinguished, a single observation being sufficient to mark it ever after. It is the pathognomonic sign of the first stage of peripneumony, disappearing on the supervention of hepatization, and reappearing with the resolution of the inflammation. It is found also in oedema of the lungs, and sometimes in pulmonary apoplexy, but in these two cases *the bubbles* usually seem to be somewhat larger and moister than in the rhonchus of peripnemony. This variety I call subcrepitous.

The Mucous Rhonchus., This is produced by the passage of the air through sputa accumulated in the bronchi, or through the softened matter of tubercles yet undischarged. It presents many varieties of character, which can hardly be defined, and of which, indeed, we can only form any notion by comparing the perceptions derived from the sense of hearing with such as we fancy might be conveyed by the sense of sight. In listening to it we receive the impression or idea of bubbles, such as are produced by blowing through a pipe into soapy water. The ear seems to appreciate most distinctly the consistence of the fluid which forms the bubbles, and also their varying sizes. The consistence of the fluid appears always greater in the mucous than in the crepitous rhonchus.

In respect of the size of the bubbles in the different rhonchi they may be estimated as *very large, large, middling, small.* The last term is especially applicable to the crepitous rhonchus of peripneumony, in which it seems as if an infinity of minute, equal-sized bubbles, formed at once, were thrilling or vibrating, rather than boiling, on the surface of a fluid. The mucous rhonchus, on the contrary, appears always larger, and most usually unequal, so as to convey the idea of a liquid into which some one is blowing, and thereby producing bubbles, of which some are the size of a filbert, and others only as large as a cherry-stone or hempseed. We can estimate the quantity as well as the size of the bubbles, and may thus designate the rhonchus as *abundant* or *rare. Ac*cordingly, it sometimes seems that the point of lung beneath the stethoscope is filled with bubbles that touch each other; and at other times there seems to be only one here and there, while the intervening portion of lung yields the simple sound of respiration, or yields no sound at all, as the case may be. When the mucous rhonchus is very large and infrequent we can distinctly perceive the bubbles form and burst. When

it exists at once copious, large, and constant, it is sometimes so noisy as to resemble the rolling of a drum.

A variety of the mucous is the *tracheal rhonchus.* It is observed when there is accumulated much mucus or other sputa in the larynx, trachea, or larger bronchial tubes, and may be readily heard by the unassisted ear, as in the case of the *dead-rattles* of the vulgar, from which I have derived the general appellation of the phenomenon. This species, or rather variety, may exist without there being any other perceived in the bronchi by the stethoscope; but the reverse of this is much more common, namely, that the instrument conveys to us a rhonchus, even a very loud one, when we perceive nothing by the unassisted ear. When examined by the cylinder, this rhonchus, which has its seat in the trachea, has almost always the character of the mucous rhonchus de-scribed above. The bubbles seem to be extremely numerous and very large. The sound is occasionally so loud as to resemble a drum or the noise of a carriage on the pavement. In these cases the rhonchus is perceived over the whole sternum, and is accompanied by a vibration very perceptible to the touch; we can even sometimes perceive it over the whole chest and through the interposed lung. In this last case, however, there is no vibration attending it, and we recognize, at once, that the sound originates in a remote point. This variety of rhonchus is sometimes so noisy as to mask the sound of the heart's action, and also of respiration, over a great portion of the chest; and in all cases where it exists in a certain degree of intensity we are unable to perceive the heart's pulsations under the sternum unless we request the patient to suspend respiration for a moment.

The tracheal rhonchus is only observed in this great degree in violent haemoptysis, and in the severer paroxysms of the mucous catarrh of old persons, termed *suffocative catarrh.* It is found in most dying persons, particularly in cases of phthisis, peripneumony, diseases of the heart, and severe idiopathic fevers. In all cases, when it exists in a high degree, it may be regarded as of evil omen. In a lesser degree it exists in the acute pulmonary catarrh, in the severe cases of the chronic mucous catarrh, and in all diseases complicated with these. It may be reckoned as one of the worst symptoms which appear in fever. In concluding this notice of the tracheal rhonchus it ought to be observed that when too slight to be heard by the naked ear, it becomes very manifest on applying the stethoscope.

The mucous rhonchus, properly so called, exists principally in the pulmonary catarrh with copious secretion of mucus, and in haemoptysis, and often also in peripneumony and phthisis. In the two former diseases it is caused by the transmission of air through the mucus or blood contained in the bronchi; in the two latter, it may have its seat in the same place, but it may also originate in cavities produced by an abscess or eschar of the lungs, or by softened tubercles. In the latter cases the rhonchus has a peculiar character which I shall denominate *cavernous.* It is more than usually *abundant and large,* and it confined also to a small space, within which we commonly observe, at the same time, both the cavernous respiration and pectoriloquism. It is more especially during the act of coughing that we detect this circumscribed or cavernous rhonchus. On some occasions we can even distinguish the consistence of the fluid contained in the excavation by means of the particular impulse communicated by the cough.

In certain rare instances the mucous rhonchus may be recognized, or at least suspected, independently of auscultation, either mediate or immediate. I have sometimes noticed, while percussing the clavicle or neighbouring parts of the chest, in phthisical cases, a sort of vibration like that yielded by a cracked pot when gently struck, accompanied with an evident hollow resonance, and even with a humid crepitation or guggling. The phenomenon indicates the presence of tuberculous excavations near the surface of the lungs. It is, however, by no means common, and has only been observed in subjects with very thin elastic chests, and, perhaps, with the clavicular ligaments more than usually lax. Some of these patients are themselves conscious of the guggling of the tuberculous matter during percussion; and others can point out the seat of the excavation from the sensation occasioned by the detachment of the sputa from it during expectoration. This last circumstance is, however, very uncommon.

I have sometimes also perceived in tuberculous excavations of the upper lobes a mucous rhonchus, or slight guggling, corresponding with, and no doubt caused by, the pulsation of the subclavian artery. This case is extremely rare, as indeed it must be, when we consider the numerous circumstances that must conspire towards its production. In an equally rare class of cases a strong mucous or cavernous rhonchus can sometimes be perceived by the naked ear, or on applying the hand to the part. I do not here allude to the guggling rhonchus of the trachea or the bronchi already noticed, but to one confined to a small space, and this often at a distance from the larger bronchial tubes. I have observed this phenomenon only in cases where the matter of an excavation had made its way through the walls of the chest, and formed a tumour beneath the skin; or where it had escaped into old cellular adhesions uniting the lungs to the chest; or, finally, where a large anfractuous excavation, half full of matter, lay near the surface of a lung closely united to the walls of the chest.*

3. The Dry Sonorous Rhonchus., This is more variable in its character than the two preceding kinds. It consists in a flat (grave) sound, sometimes extremely loud, resembling at times the snoring of a person asleep, at other times the sound produced by friction on a bass string, and occasionally the cooing of the wood-pigeon. This resemblance is sometimes so striking that we might be tempted to believe the bird concealed under the patient's bed. This last variety of sound is commonly confined to a small space. I have sometimes observed it in cases of pulmonary fistulae of a middling size, and also in cases of dilated bronchi. I apprehend it can hardly exist in bronchial tubes of a small diameter. We must not confound the sonorous rhonchus with the guttural sounds formerly mentioned, which, unlike this, have their seat in the fauces, as may be ascertained by the application of the stethoscope.

It is difficult to ascertain the precise cause of this species of rhonchus. Neither the character of the sound nor the examination of the parts after death leads to the belief that it depends on the passage of the breath through any kind of matter. On the contrary, it would seem to depend rather on some alteration in the shape of the tubes through which the air passes, and I am disposed to attribute it in most cases to the contraction,

from some cause or other, of the origin of a bronchial branch. This contraction may be either permanent or temporary, and may be occasioned by the pressure of an enlarged gland or of a circumscribed spot of inflammation, the presence of a tenacious clot of mucus, or the local thickening of the mucous membrane. It may not be easy on these grounds to explain the reason of the key of the sound being flatter instead of sharper, as might be expected from the contraction of the aperture; but we have an analogous case in the thickening of the membrane of the larynx and glottis in catarrh, when the voice, as we know, becomes hoarse and flatter than natural.

The Dry Sibilous Rhonchus., This is also of very various character. Sometimes it is like a prolonged whistle, flat or sharp, dull or loud; sometimes it is very momentary, and resembles the chirping of birds, the sound emitted by suddenly separating two portions of smooth oiled stone, or by the action of a small valve. The different kinds often exist together in different parts of the lungs or successively in the same part. The peculiar nature of the sound, and the appearances on dissection, seem to prove the sibilant rattle to be owing to minute portions of very viscid mucus obstructing, more or less completely, the small bronchial ramifications. This explanation applies more especially to the variety resembling the sound of a valve, which is, indeed, only a variety of the mucous rhonchus; the kind more strictly sibilous is probably occasioned rather by a local contraction of the smaller bronchi from thickening of their inner membrane.

The Dry Crepitous Rhonchus, with Large Bubbles., This species is observed only during inspiration. It conveys the impression as of air entering and distending lungs which had been dried, and of which the cells had been very unequally dilated, and entirely resembles the sound produced by blowing into a dried bladder.

This variety is the pathognomonic sign of emphysema of the pulmonary substance and of the interlobular emphysema. In the last disease it is much more distinct. We have a sound like this in the common subcutaneous emphysema, on pressing interruptedly with the ear on the stethoscope, or with the fingers, in the vicinity of the affected part.

Besides the peculiar sound produced by the various species of rhonchus, there is also to be noticed a slight vibration communicated to the cylinder when the seat of the phenomenon happens to be immediately beneath it. This sensation, like that occasioned by the voice, may sometimes be felt by the hand very distinctly. It is usually very strongly marked in the mucous and sonorous rhonchi, less in the crepitant, and still less in the sibilous. When the rhonchus has its seat remote from the point where the instrument rests, although it is heard very strongly, no vibration is felt; and when this can be discovered in no point of the surface of the chest, we may conclude that the cause of the rhonchus exists in the central parts of the lungs. This distinction may appear subtile, but I can assure the reader that it is one very easily made; and that a very little experience will enable any one to ascertain the distance of the rhonchus from the point of exploration.

Some of the species of rhonchus, especially the mucous and crepitous, cannot be distinguished at the distance of one or two inches from their site. The other kinds may frequently be perceived through the whole width of the chest, and are thus often combined

with the former. In this manner, while we perceive a mucous rhonchus on one side of the chest, we may at the very same instant hear a dry sonorous rhonchus, which has its seat in the opposite lung. This complication is, however, very easily distinguished from a simple mucous rhonchus, however noisy.

From the very striking and conspicuous characters of the vari*ous rhonchi* described it might be imagined that they would furnish some of the most valuable of our diagnostic signs. Taken singly, however, they are very inferior in this respect to the data supplied by auscultation of the respiration and the voice. Con-joined with other signs they become extremely valuable; the two crepitous rhonchi, and also and more especially the cavernous, are frequently more certain than any other of our signs.

II. Of the metallic tinkling

This phenomenon consists of a peculiar sound which bears a striking resemblance to that emitted by a cup of metal, glass, or porcelain, when gently struck with a pin, or into which a grain of sand is dropped. This sound does not at all depend on the nature of the materials of which the stethoscope is composed: it is perceived during respiration, speaking, and coughing; but is much more perceptible during the two latter than the former. The reverse of this is, however, sometimes the case. It is, in general, heard in a most striking manner during coughing; and when in any degree doubtful, this action ought to be performed.

The metallic tinkling produced by the voice differs according as pectoriloquy exists or not. In the former case *the tinkling,* as well as the voice, traverses the tube; in the latter, we merely hear within the chest a slight sharp sound like that occasioned by the vibration of a metallic cord touched by the finger.

The metallic tinkling always originates in a morbid excavation within the chest, containing partly air and partly liquid. It exists only, therefore, in two cases, viz., where a serous or purulent effusion co-exists with pneumo-thorax; or when a large tuberculous excavation of the lung is only partly filled with very liquid pus. It is further necessary, for the manifestation of this phenomenon, in cases of empyema or hydrothorax complicated with pneumo-thorax, that the cavity of the pleura should communicate directly with a bronchial tube by means of a fistula, such as has place when a tuberculous vomica, abscess, or eschar of the lungs opens into the chest. This sign may, on this account, be considered as pathognomonic of this triple lesion. From it we may also further have an idea of the size of the fistulous perforation, as well as of the relative proportion of air and liquid in the chest, since the phenomenon is more distinct according as the fistula is larger; while the extent of the vibrations of the sound corresponds with the extent of the spaces occupied by the air.*

Sometimes the tinkling assumes another character, and strikingly resembles the sound produced by blowing into a flask or bottle. This, like the tinkling, is equally produced by the cough, voice, or respiration; and in some cases the tinkling accompanies one of these and the buzzing of the other. I have named it from analogy, *utricular buzzing,*

or *amphoric resonance (bourdonnement amphorique)*. This sound sometimes co-exists and sometimes alternates with metallic tinkling. Where the resonance or buzzing exists alone, or much more frequently than the tinkling, I have been led to attribute it either to there being more than one fistulous opening, or to the cavity in which it originates being very large, and containing only a very small quantity of liquid.t

I had long suspected that the metallic tinkling and amphoric resonance would be heard after the operation of empyema, but it was not till April, 1822, that I was enabled to verify my conjecture, in the case of a patient who had been operated on about a month before. When an injection was thrown in by the wound, the fall of the liquid upon that previously in the cavity of the chest produced a well-marked tinkling. The stethoscope did not detect any respiratory sound in the part affected, but the entrance and escape of the air through the wound gave rise to an extremely distinct utricular buzzing. Upon plugging the wound a slight and dull hissing, occasioned by the passage of the air by the side of the tent, was only heard; but when the patient spoke, a distinct tinkling was perceived. This last fact would seem to show that a large communication with the external air converts the tinkling into simple buzzing. It is worthy of note in this case that there was no fistulous communication between the pleura and bronchi, and consequently that the tinkling sound could only be produced by the vibration occasioned by the resonance of the voice in the lung, which latter, it is further to be observed, was greatly compressed and covered with a strong false membrane. The metallic tinkling and utricular buzzing never exist unless when the air in the pleura communicates with the bronchi, except in the rare case mentioned in the note.*

I expect that future observations will discover other phenomena foreign to those naturally produced by the respiration, cough, and action of the heart, and which may prove useful signs in particular cases; yet I think it probable that such signs will be few in number, since, in the period that has elapsed since the publication of my first edition, my own researches, as well as those made in all the hospitals of Paris by a great many physicians and pupils, have discovered only a single one of the kind. I owe this to Dr. Honore, who first perceived it in a case of pleuro-peripneumony in the spring of 1824, and afterwards in June of the same year.

This latter patient I saw, and made the following observations on his case: the sound of respiration was feeble over the whole chest, and nearly extinct in the inferior part of the left side, which had been the seat of the effusion. On applying the stethoscope on the fourth rib, about three inches from its cartilaginous portion, I perceived a dull sound, such as would be produced under the stethoscope by the friction of the finger against a bone, and further conveying the sensation as of a body rising and falling, and at the same time rubbing somewhat harshly against another. The site of the phenomenon was evidently very close to the walls of the chest. It was only very distinct when the inspirations were deep; and at these times not only was the patient sensible of the circumstance, but it was perceptible to us on applying the hand over the part. I have since observed the same thing in twelve or fifteen cases, under different circumstances, and have been able to ascertain its most frequent cause. In most cases, then, this phenomenon (which I shall call the

sound of friction of ascent and descent) is occasioned by the interlobular emphysema of the lungs. Together with the *crackling rhonchus,* or *dry crepitous rhonchus with large bubbles,* it is indeed the pathognomonic sign of this lesion; and, as will be seen hereafter, may offer many varieties of character.

In passing in review all the known lesions of the lungs and pleura, there is one other which might possibly give occasion to this sound of friction the existence, namely, of a cartilaginous, bony, tuberculous, or other indurated tumor projecting from the surface of the lung. This is, however, a mere conjecture; but should it prove true, it is probable that the case in question would be readily distinguishable from emphysema, firstly, because it would present none of the other signs of the last-mentioned disease; and, secondly, because, owing to the accompanying humidity of the surfaces, the resulting sounds would be duller and softer.

As the exploration of the heart and large vessels affords only diagnostic signs in the diseases of these organs, I shall defer the notice of this branch of auscultation until I come to treat of them, and I shall transfer to the Appendix the application of the method to the diagnosis of several cases unconnected with diseases of the chest.

* Sometimes when the sound of respiration is suspended or very weak, the *bubbles* of the mucous rhonchus become very small, few in number, and not perceptible, except on a deep inspiration; at other times, when the respiration is pretty good, it is found not to be *pure* or *clear.* An inexperienced auscultator might be apt to confound these varieties (which may be named *obscure)* with a weak, crepitous rhonchus., AUTHOR.

* This may also be very exactly done by means of auscultation and percussion; the latter gives the sound of great emptiness, intermixed now and then with tinkling. I conceive that the phenomenon will be less distinct when the liquid is in *very small* quantity than where it is in more equal proportion with the air., AUTHOR.

* The metallic tinkling is also sometimes heard independently of the voice, cough, or respiration; namely, when a patient affected with pneumo-thorax with liquid effusion is placed in the sitting posture, and some of the fluid which still adheres to the upper part of the cavity falls in drops into that beneath., AUTHOR.

* There is a phenomenon of no value as a sign, but which an inexperienced observer might perhaps mistake for the metallic tinkling. If one percusses the chest at the same time that the stethoscope is applied, more especially close to the instrument, we perceive a sort of *metallic clicking* very like that produced by the handling of firearms in the military exercise. The same is sometimes perceived, in a less degree, during coughing., AUTHOR.

ON PERMANENT PATENCY OF THE MOUTH OF THE AORTA OR INADEQUACY OF THE AORTIC VALVES

Sir Dominic John Corrigan, M.D.

Sir Dominic John Corrigan (1802-1880) was a very hard working Irish physician. His description of a jerky carotid pulse is an important diagnostic sign of aortic insufficiency and regurgitation. This condition was also described by Thomas Hodgkin (1798-1866) in the London Medical Gazette, as: *retroversion of the valves of the aorta*. The medical sign is known today as Corrigan's Pulse and is as pertinent as ever. Corrigan's finding was published in *The Edinburgh Medical and Surgical Journal*, 37: pp. 225-245, in 1832. (White 2009)

The disease to which the above name is given has not, so far as I am aware, been described in any of the works on diseases of the heart. The object of the present paper is to supply deficiency. The disease is not uncommon. It forms a considerable proportion of cases of deranged action of the heart, and it deserves attention from its peculiar signs, its progress, and its treatment. The pathological essence of the disease consists in inefficiency of the valvular apparatus at the mouth of the aorta, in consequence of which the blood sent into the aorta regurgitates into the ventricle. This regurgitation, and the signs by which it is denoted, are not necessarily connected with one particular change of structure in the valvular apparatus, and hence the name *Permanent Patency of* the Mouth of the Aorta, or Inadequacy of the Aortic Valves, has been chosen as simply expressing such a state of the parts as permits the regurgitation to occur.

I have been in the habit for some years of describing this disease under the name of *Inadequacy of the Aortic Valves;* but as Dr. Elliotson, in his elegantly written work on Diseases of the Heart, has given to a somewhat analogous morbid state of the auriculoventricular opening, a better name, *Permanent Patency, I* have, for that reason, and for the sake of uniformity, adopted the term, and I shall continue to use it as synonymous with my own term, *Inadequacy of the Aortic Valves.*

The morbid affections of the valves and aorta permitting this regurgitation are the following.

1st. The valves may be absorbed in patches, and thus become reticulated and present holes, through which the blood flows back into the ventricle.

2 d., One or more of the valves may be ruptured; the ruptured valves, when pressed, flapping back into the ventricle instead of catching and supporting the column of blood in the aorta, the blood then regurgitating through the space left by the broken valves.

3 d., The valves may be tightened or curled in against the sides of the aorta, so that they cannot spread across its mouth; and an opening is then left between the valves, in the centre of the vessel, through which the blood flows freely back into the ventricle.

4th., The valves without any proper organic lesion may be rendered inadequate to their function by dilatation of the mouth of the aorta. The aorta, affected by aneurism, or dilated, as it frequently is in elderly persons, about its arch, will sometimes have the dilatation extending to the mouth of the vessel, and in such a case, the valves become inadequate to their function, not from any disease in themselves, but from the mouth of the aorta dilating to such a diameter, as to render the valves unable to meet in its centre; the blood then, as in the other instances, regurgitates freely into the ventricle.

General Symptoms

On the general symptoms that accompany this disease, little is necessary to be said. Like most of those connected with affections of the respiratory and circulating organs, they are uncertain and unsatisfactory. There are frequently convulsive fits of coughing, more or less dyspnoea, sense of straitness and oppression across the chest, palpitations after exercise, sounds of rushing in the ears, and inability to lie down. Neither one nor all of these symptoms are essential to the disease. They may all arise from varied affections of the lungs, heart, liver, or nervous system. They neither tell us the seat of the disease, nor the extent of the danger.

Signs

What is deficient in general symptoms from their obscurity, is, however, amply supplied by the certainty of the physical and stethoscopic signs, which may be referred to the three following indications. *1st,* Visible pulsation of the arteries of the head and superior extremities. *2d, Bruit de soufflet* in the ascending aorta, in the carotids, and subclavians. *3d, Bruit de soufflet* and *fremissement,* or a peculiar rushing thrill felt by the finger, in the carotids and subclavians. In conjunction with these may be reckoned the pulse, which is invariably full. When a patient affected by the disease is stripped, the arterial trunks of the head, neck, and superior extremities immediately catch the eye by their singular pulsation. At each diastole the subclavian, carotid, temporal, brachial, and in some cases even the palmar arteries, are suddenly thrown from their bed, bounding up under the skin. The pulsations of these arteries may be observed in a healthy person through a considerable portion of their tract, and become still more marked after exercise or exertion; but in the disease now under consideration, the degree

to which the vessels are thrown out is excessive. Though a moment before unmarked, they are at each pulsation thrown out on the surface in the strongest relief. From its singular and striking appearance, the name of *visible pulsation is* given to this beating of the arteries. It is accompanied with *bruit de soufflet* in the ascending aorta, carotids, and subclavians; and in the carotids and subclavians, where they can be examined by the finger, there is felt *fremissement,* or the peculiar rushing thrill, accompanying with *bruit de soufflet* each diastole of these vessels. These three signs are so intimately connected with the pathological causes of the disease, and arise so directly from the mechanical inadequacy of the valves, that they afford unerring indications of the nature of the disease. In order to under-stand their value, it is necessary to consider their connection with the cause by which they are produced. The visible pulsations of the arteries of the neck, etc. may be first examined.

In the perfect state of the mechanism at the mouth of the aorta, the semi-lunar valves, immediately after each contraction of the ventricle, are thrown back across the mouth of the aorta by the pressure of the blood beyond them, and when adequate to their function of closing the mouth of this vessel, they retain in the aorta the blood sent in from the ventricle, thus keeping the aorta and larger vessels distended. These vessels consequently preserve nearly the same bulk during their systole and diastole. But when the semilunar valves, from any of the causes enumerated, become incapable of closing the mouth of the aorta, then after each contraction of the ventricle, a portion of the blood just sent into the aorta, greater or less, according to the degree of the inadequacy of the valves, returns back into the ventricle. Hence the ascending aorta and arteries arising from it, pouring back a portion of their contained blood, become, after each contraction of the ventricle, flaccid* or lessened in their diameter. While they are in this state, the ventricle again contracts and impels quickly into these vessels a quantity of blood, which suddenly and greatly dilates them. The *diastole* of these vessels is thus marked by so sudden and so great an increase of size as to present the visible pulsation which constitutes one of the signs of the disease.

That this visible pulsation of the arteries is owing to the mechanical cause here assigned is made evident by several circumstances. It is most distinct in the arteries of the head and neck, which empty themselves most easily into the aorta, and of course, into the ventricle. In the arteries of the lower extremities of even larger size than those which present it about the head and neck, it is not seen to any comparative degree, and most generally not at all while the patient is standing or sitting. It is much more marked in the arteries of the head and neck in the erect than in the horizontal posture; and a patient suffering under the disease himself, first pointed out a circumstance which is convincing of its being produced as asserted. He could increase the pulsation of the brachial and palmar arteries in a most striking degree by merely elevating his arms to a perpendicular position above his head. He thus enabled the brachial and palmar arteries to empty themselves more easily back upon the aorta. They became more flaccid, and then, on the next contraction of the ventricle, their diastole became comparatively greater, and their visible pulsation of course more marked. The same effect could be

produced in the arteries of the lower extremities by lying down and elevating the legs on an inclined plane. The strength of the heart has little to do in producing this singular pulsation, for it is never observed in an equal degree, and most generally not at all, in the arteries of the lower extremities.

If it be asked, is the explanation here adduced of the cause of this visible pulsation sufficient to account for its appearance in the brachial and radial arteries, since the blood to return back from these vessels into the arch of the aorta should flow upward when the patient holds his arms in the ordinary position, flexed or by hanging by his side? The following reply may be made. When the subclavians are pouring back their blood into the arch of the aorta and ventricle, the elasticity of the brachial arteries, acting upon the blood just urged into them, forces it back along with the retrograde current of the subclavians, no obstacle meeting it in that direction. The brachial arteries thus partially empty them-selves, and become in their systole of a lessened diameter like the carotids and subclavians, but in less degree. The next jet of blood from the ventricle dilates them, and as in the subclavians, produces in them a visible pulsation; and if they be assisted in returning their blood by elevating the arms to a perpendicular position, their pulsation becomes, as has been already observed, much more strongly marked. The arteries of the lower extremities are not similarly circumstanced. The arteries of the upper extremities are assisted in emptying themselves back towards the heart, by the retrograde current in the subclavians and ascending aorta; but on the blood contained in the arteries of the lower extremities, the tall column of blood in the descending aorta is pressing, and prevents any return; or if it be supposed that of the large mass of blood in the descending aorta, a small portion flows back into the arch, it can produce little change in the contents of the iliacs and femorals; and moreover, whether the column of blood in the aorta be lessened or not in diameter, the pressure on the contained blood of the iliacs and femorals will remain the same, and keep these vessels distended. If we, however, as already observed, after the relation of the several arteries to the arch of the aorta, so as to facilitate the reflux of their contained blood, for instance from the radial arteries, by raising the arms to a perpendicular line above the head, from the iliacs and femorals, by placing the patient in a recumbent posture, and raising the legs upwards on an inclined plane, the visible pulsation becomes much more marked in these respective arteries.

The *bruit de soufflet,* which is heard in the ascending aorta, carotids, and subclavians, with the accompanying *fremissement* in the latter arteries, is next to be considered. The *bruit de soufflet* characterizing this disease, is heard, as already observed, in the ascending aorta, its arch, and in the carotids and subclavians. It can be followed upwards from the fourth rib along the course of the aorta, increasing in loudness as it ascends, until it is heard of great intensity at the upper part of the sternum, where the arch of the aorta most nearly approaches this bone, and then branching to the right and left, it can be traced into the carotids and subclavians of both sides; and in these trunks it assumes a harshness that it did not possess in the aorta. This *bruit de soufflet* is synchronous with the visible pulsation with the diastole of the arteries. It is no consequence whether the

ascending aorta and its large branches be sound or be diseased; the *bruit de soufflet is* as loud in the one case as in the other. To account for the presence of this sign, and why it extends so far from the seat of the disease and along sound vessels, it is necessary to refer to a paper published in the *Lancet* of 1829, Vol. II, p. 1.* Continued observations from the date of that paper to the present, have confirmed the view then taken of the cause of that singular sound; of its being dependent, purely on a physical cause, on a mechanical change in the manner of the blood's flowing.

In that paper is related an experiment, which it may be well to recapitulate here. A flexible tube, such as a piece of small intestine, or a portion of artery, is connected by one end with a tube which has a current of water of considerable force running through it. While the piece of intestine or artery is kept fully distended by the supply of water from the tube, no sound is produced by the motion of the fluid; but if the flexible tube, while the fluid is moving through it, be pressed upon in any part, so that the quantity of fluid passing through the contracted part is no longer sufficient to keep the further portion of the tube tense, then, beyond the contracted part, where the tube is less tense, or in some degree flaccid, a distinct, and according to the velocity or force of the current, a loud *bruit de soufflet is* heard; and, at the same time, if the finger be gently laid upon the part of the tube where the *bruit de soufflet is* heard, a slight trembling of the tube is perceived, evidently arising from the vibrations into which the current within is throwing its sides. If, in place of constricing any one part of the flexible tube, the whole tract of the tube be allowed to become partially flaccid, by diminishing the supply of fluid, and the fluid be then allowed to rush along the tube by jets, at each jet the tube is suddenly distended, resembling the visible pulsation described above; and with each diastole of the tube, there is a sudden a loud *bruit de soufflet;* and, synchronous with the *bruit de soufflet,* there is *fremissement* felt by the finger.

Both the sound heard and the sensation felt by the finger in this experiment may be explained by the principles which regulate the motion of fluids. It may be remarked, that it is a property of fluid in motion, that, when discharging itself from the orifice of a tube into open space, or into a vessel of wider capacity not fully distended, its particles move in lines from the orifice, like so many *radii* tending to leave vacuums between them. When the flexible tube, artery or intestine, therefore, is kept fully distended, the fluid moves forward as a mass, there is no tendency in its particles to separate from one another, they all press equally, there is no vibratory motion of the sides of the tube, and consequently no sound, and no *fremissement* or trembling. But if the tube be not kept fully distended, then the fluid propelled through it rushes along as a current; and its particles tending to leave vacuums between them, throw the sides of the tube into vibrations, which can be very distinctly felt by the finger, and which give to the ear the peculiar sound *bruit de soufilet,* and to the touch *fremissement.*

These principles may be applied to the state of the ascending aorta and its branches in the instances before us. When the aortic valves are fully adequate to their function of perfectly closing the mouth of the aorta, and thus preventing any regurgitation of blood, the aorta and its branches are kept fully distended, the blood is at each contraction of

the ventricle propelled forward *en masse,* and there is no trembling, or vibratory motion of the sides of the aorta, carotids, and subclavians, and, as in the flexible tubewhen fully distended, no sound is emitted. But when the valves, becoming inadequate to their office, permit some of the blood contained in the ascending aorta, carotids, and subclavians, to return into the left ventricle after each contraction, then the aorta and these trunks become, like the flexible tube in the second part of the experiment partially flaccid; and at the next contraction of the ventricle, the blood propelled into them is sent along as a rushing current, which throws the sides of these arteries into vibrations, and these vibrations give to the ear *bruit de soufflet,* and to the finger *fremissement.* These two signs may be traced to a varying distance from the mouth of the aorta, and always along the carotids, and to the outer third of the subclavians, and some-times in the brachial arteries, as far as the bend of the arms, the distance to which they are heard being determined by the limit to which the current-like motion of the blood producing them is extended. In those cases in which the deficiency of the valves is considerable, allowing a full stream of blood to rush back into the ventricle, there is heard in the ascending aorta a double *bruit;* the first accompanying the *diastole* of the artery, the second immediately succeeding; and, in listening to the two sounds constituting this double *bruit de soufflet,* the impression made distinctly on the ear is that the first sound is from a rushing of blood up the aorta, the second from a rushing of it back into the ventricle. It is impossible for those who have not heard this double *bruit* to conceive the distinctness with which the impression described is made on the ear. A patient in one instance heard this double sound distinctly in his own person, and referred it to its cause, a rushing of blood *from* and *to* the heart. The *bruit de soufflet* and *fremissement* are not perceived in the arteries of the lower extremities, when the patient is in a sitting or standing posture. The pressure of the blood in the abdominal aorta is sufficient in these postures to keep the vessels arising from it fully distended; and thus no vibratory motion of their parietes being permitted, there is no bellows sound; nor *fremissement* or rushing thrill.

History and Progress of the Disease.Of eleven cases of the disease, only two occurred in females, and in both of these the valves were nearly quite sound in texture; but the aorta being thinned and dilated, the valves could not meet so as to prevent regurgitation. None of the cases occurred in very early age. The youngest person presented labouring under the disease was twenty years of age. In this respect, inadequacy of the aortic valve differs from narrowing of the left auriculo-ventricular opening, which is not unfrequently met with in children, and even in infants at the breast. The causes of the disease are uncertain. In one case the disease followed an attack of acute rheumatism, which had been accompanied with symptoms of *pericarditis.* In some cases the commencement of the disease was referred by the patient to an inflammatory affection of the chest, which had occurred months or years before; while in others no cause or date could be as-signed.

The symptoms accompanying its commencement and progress are very variable. Most generally the patient describes the first sensations as having been a feeling of

oppression and straitness across the chest, with palpitation of the heart on any unusual exercise. These symptoms become gradually more distressing, and are after a very uncertain period of time accompanied by fits of coughing resembling paroxysms of asthma, and terminating in scanty expectoration. In a few cases, however, cough was not at any time, even up to the last hours of life, an urgent symptom; the oppression and straitness of the chest, with palpitation on any exertion, and an anxiety for a supply of fresh air, being the principal complaints. As the disease proceeds, the straitness and oppression about the chest become more distressing; fits of coughing more frequent; and the patient has an anxiety, approaching to agony, for a free supply of fresh air, frequently starting from bed at night under the dread of suffocation. In the last stage the state of suffering is extreme. The patient will not lie down for a moment from the dread of suffocation. The face, which had been pale, becomes purple on the lips as in suffocative catarrh; oedema of the legs comes on, followed ultimately by oedema of the hands and arms; there is no sleep, or there are almost incessant startings from it; the countenance assumes a most painful expression of sinking; and the patient at length dies exhausted. The pulse in no case was under eighty. It ranged from that to 110; and in every case it has been all through the disease (unless influenced by medicine) full and vibrating, even to within a few hours of death. In the course of the disease, the superficial branches of the carotids, the brachial arteries, the radial, and the ulnar, and their branches, wherever near enough to the surface to be traced, become apparently enlarged, and remarkably tortuous; the brachial artery in parts of its course often almost doubling upon itself. The *fremissement,* or rushing thrill, de-scribed as easily felt in the subclavians and carotids, can some-times be felt by moderate tact as fast as the pulse in the wrist. The heart in all the cases that occurred was enormously enlarged, and its bulk arose from the state of the left ventricle, which in some cases was so much enlarged in cavity and in thickness, as to make the organ resemble rather the heart of a bullock than that of a man. The other parts of the heart, although necessarily obliged to keep pace in some measure with this increased size, did not at all partake equally in the enlarged bulk. The impulse of the heart was far less than natural, even in cases where the hypertrophy of the left ventricle was greatest. In some of them no impulse could be felt; and in none did the impulse during life give at all a proportional measure of the excessive hypertrophy discovered after death.*

Haemoptysis very rarely occurs in the course of the disease, and the lungs are generally found after death permeable to air, and remarkably healthy. This is owing to the sound state of the auriculo-ventricular opening of its valves. This opening being full sized, permits the blood of pass with freedom into the ventricle, where it is retained by the sound auriculo-ventricular valves; and thus those sudden congestions of the blood vessels of the lungs, so common in narrowing of the left auriculo-ventricular opening, are remarkably rare. The manner of death in inadequacy of the aortic valves is different from that in narrowing of the auriculoventricular opening. In the latter, owing to the obstacle presented by the narrowed opening to the passage of blood into the ventricle, the lungs are by any slight exciting cause suddenly congested; and the patient dies, not

from the direct effect of the organic affection of the heart, but from the superinduced affection of the lungs, pulmonary apoplexy, pneumonia, or suffocative catarrh. In the disease under consideration, the patient appears to die of mere exhaustion. The inefficiency of the valves of the aorta throws a great increase of labour on the left ventricle. The muscular energy of this part of the heart is in the course of time worn out. The heart is at length incapable of sustaining the column of blood incessantly pressing upon it; it ceases to contract and is found after death largely distended with blood. The symptoms preceding death are in accordance with this state. For some days, or even weeks, before death, nature appears to be struggling against overwhelming exhaustion. The patient is constantly in the most heart-rending tone imploring to be relieved of the weight that is upon him; the countenance expresses the greatest sinking and distress; there are anxious calls for fresh air and a continual restlessness, similar to what is seen in a patient sinking from hemorrhage; and when in this state the patient in some trifling motion dies exhausted.

The duration of this disease is very uncertain. No case was of less duration than two or three years, and some of the cases at present under treatment have been of seven or eight years standing. The time during which the disease may continue without terminating fatally, seems to depend principally upon the extent to which regurgitation is permitted. The cases in which the valves, from small perforations, allowed but little regurgitation continued for many years; while the case which furnished the Plate No. II and in which the valves were ruptured and much injured, allowing considerable regurgitation, terminated fatally in less than three years.

Diagnosis

Inadequacy of the aortic valves may be confounded with narrowing of the mouth of the aorta, either congenital or from diseased valves, with disease of the auriculo-ventricular valves, with aneurism of the arch of the aorta or *arteria innominata,* with nervous palpitations, and with asthma. Congenital narrowing of the mouth of the aorta is a very rare disease, but narrowing of the mouth of this vessel produced by vegetations on the valves is not unusual; and *bruit de soufflet is* a sign common to it, and to the disease we are considering. The resemblance between the signs of the two diseases extends, however, no farther. The visible pulsation of the arteries, arising from the arch of the aorta, which forms so striking a sign of inadequacy of the aortic valves, is wanting in narrowing of the mouth of the aorta. The pulse also is strikingly different in the two diseases. In narrowing of the aortic orifice it is small and contracted; in inadequacy of the aortic valves it is invariably full and swelling. In narrowing of the aortic orifice there is generally a marked contrast between the pulse and the impulse of the heart. The pulse is small and contracted; the impulse of the heart is strong and energetic. In the disease we are considering, when there is a contrast it is always in the inverse way; for while the arteries beat with violence, and the pulse is strong and full, the impulse of the heart is scarcely perceptible. When the mitral valves, becoming

indurated or ossified, produce narrowing of the auriculo-ventricular opening, that narrowing produces *bruit de soufflet;** and the *bruit de soufflet* thus produced might be confounded with that accompanying inadequacy of the aortic valves. Independently of the visible pulsation of the arteries, and the state of the pulse, which accompany inadequacy of the aortic valves, stethoscopic examination points out with certainty the distinction of the two diseases. When the *bruit de soufflet* is produced by narrowing of the auriculo-ventricular opening it is heard loudest just where the impulse of the heart against the side is felt; it comes with the impulse, and if loud it seems to rush into the ear; and as the stethoscope is removed from this point up-wards along the sternum, it is heard growing fainter the farther the point of examination is from the point where the impulse is felt. In inadequacy of the aortic valves, the converse holds. For over the point where the impulse is or should be felt, *bruit de soufflet is* either not heard at all, or heard very indistinctly; but as the stethoscope is moved upwards from the heart, in a line corresponding with the ascending aorta, the *bruit de soufflet is* heard growing louder and louder, until over the arch of the aorta, and in the large trunks arising from it, the sound grates upon the ear with harshness.

Permanent patency of the mouth of the aorta may be mistaken for aneurism. If the arch of the aorta and *arteria innominata* approach more nearly than usual to the notch of the sternum, the visible pulsation at the root of the neck becomes so prominent, as to lead to a supposition that there is aneurism, and even of considerable size at this part.

Very lately a case came under my observation, in which there was a remarkable resemblance to aneurism. So strong were the pulsations for years in the region of the *arteria innominata,* that until the examination after death there was never even a doubt expressed that the case was not aneurism. The aorta was thinned, and was dilated so much as to render the valves inadequate totheir office, and leave a permanent patency between them. The *arteria innominata,* the carotids, and subclavians, were also dilated beyond their natural size, thus increasing the appearance of the pulsation, but there was no trace whatever of aneurism in the *arteria innominata,* such as had been supposed to exist there during life. An acquaintance with the disease under consideration, and a knowledge of the fact, that a violent throbbing at the root of the neck, or notch of the sternum, may arise from another cause than aneurism, will prevent the forming of a rash opinion on the cause of the violent throbbing. This throbbing may proceed from aneurism, or may arise from inadequacy of the aortic valves. When it proceeds from aneurism of the arch, or of the *arteria innominata,* it is confined to the vessel or the region of the vessel affected; the other trunks arising from the arch present only their natural, or even a diminished pulsation, and there is in the trunks arising from the arch neither *bruit de soufflet* nor *fremissement.* On the contrary, when the throbbing at the notch of the *sternum,* or in the region of the *arteria innominata is* from inadequate aortic valves, all the larger trunks arising from the arch pulsate in an equal degree, or with trifling differences, arising merely from the relative sizes of the vessels, or their relation to the surface, and they are never at any time without *bruit de soufflet* and *fremissement.*

Not only in relation to treatment, but in regard to the patient's mental anxiety, it is of importance to be aware, that inadequacy of the aortic valves may, by this violent pulsation at the root of the neck, closely simulate aneurism of the arch of the aorta, or the root of the *arteria innominata.* In aneurism of the aorta life is not for the moment secure, and it may be necessary that even for a remote hope of cure the patient should totally abstain from all exertion. In permanent patency of the mouth of the aorta the fatal result is never sudden; and under proper restriction the patient is not only able to lead an active life for years, but is actually benefited by doing so.

The two diseases, aneurism of the aorta, and inadequacy of the valves, may, however, be combined. Aneurism of the ascending aorta may, by extending to the mouth of this vessel, dilate it so, that the valves are unable to meet, and there is then a combination of the two diseases; there is aneurism and there is permanent patency of the aortic opening. The first cases that came under my observation presenting the signs of inadequacy of the aortic valves were cases in which the valves were rendered useless in this way, namely, by the mouth of the aorta sharing in the aneurismal dilatation. These cases led me into an error; for, meeting the signs of permanent patency of the aortic orifice in conjunction with aneurism, I erroneously attributed to the aneurism the signs which arose from the permanent patency. * Aneurism of the aorta of itself does not produce the signs arising from permanent patency of the mouth of the aorta. It can only produce them in the way already described, by involving in the dilatation the mouth of the aorta; and hence, when in conjunction with an aneurismal tumour of the *arteria innominata* or aorta, there are found visible pulsation, *bruit de soufflet,* and *fremissement* in the ascending aorta, and the trunks arising from it, we may be certain, that, in addition to the aneurism, there is a defect in the aortic valves, or that the aneurism has extended downwards, involving the mouth of the aorta. On the other hand, if these signs be absent, the valves are sound, and the mouth of the aorta is not included in the disease. The propriety of performing Mr. Wardrop's, or indeed the common operation for aneurism about the neck, might depend on the information thus acquired of the state of the aortic valves. To perform either in a case where the aneurismal dilatation was so extensive as to involve the mouth of the aorta, or where the aortic valves were diseased, would only bring the surgical treatment of the disease into unmerited discredit.

Palpitation of the larger arterial trunks, depending on derangements of the nervous system, will sometimes in thier violence simulate the visible pulsation arising from inadequate aortic valves; and in females these palpitations will last not only for months but for years, and seem to justify an opinion that there is organic disease of the heart. This nervous palpitation is not, however, accompanied by *bruit de soufflet* and *frimissement;* and the absence of these two signs is conclusive as to the nature of the disease. Sometimes, however, more than one examination is required before pronouncing a positive opinion; for in a nervous patient, the alarm excited by the first examination will render the circulation hurried and irregular, and hence there may be in the carotid or subclavian a momentary *bruit de soufflet.* In making the examination it is moreover necessary, that the edge of the stethoscope should not be allowed to press on the artery,

because its pressure is sometimes sufficient in those cases to produce the sound. When the *bruit de soufflet* and *fremissement* are only momentary, no value should be attached to them. In permanent patency of the aorta they are never absent. The convulsive fits of coughing ending in difficult mucous expectoration have made some cases of this disease be mistaken for asthma, and the state of the pulse has served to maintain the error; for the pulse being remarkably full, as it always is in the disease we are considering, seemed to be sufficient evidence that there was in the heart no obstruction to the circulation; hence the convulsive fits of coughing were supposed to have their origin in the lungs. With a knowledge of the signs afforded by the disease, no one of even moderate acquaintance with the stethoscope can confound it with asthma; without a knowledge of the stethoscope it will, however, be impossible in very many instances to distinguish between the two diseases. General symptoms will give no information on which the slightest reliance can be placed.

Treatment

There is no class of diseases to which the scientific principles that guide modern medicine have been less applied than to diseases of the heart. From its curious mechanism, from the varied derangements to which that mechanism is subject, from the number of tissues that enter into its formation, and from its numerous sympathies, its diseases frequently demand most opposite lines of treatment; and yet, it would seem, from the perusal of works on the subject, that one principle were thought sufficient for guiding the treatment of nearly all the diseases of this important organ. With the idea of heart disease, is too frequently associated the notion that such disease, without regard to its precise nature or its cause, requires the action and continued enforcement of measures calculated to exhaust strength and depress vital energy; and this error is sanctioned by the standard works on the treatment of heart disease.

Corvisart says, that "in a great number of organic lesions of the heart, as, for example, in active aneurism, the indication is to diminish the general strength of the patient, and that of the heart in particular." Laënnec, says that "though we cannot remove indurations of the valves and narrowing of their openings, we are nevertheless in such cases to follow up the same measures (bleeding and starving), to remove or diminish hypertrophy;" and Berlin, states that "the treatment of valvular alterations is to consist of general and local bleedings, of low diet, of preparations of digitalis," etc.; and, "that the measures to be employed against hypertrophy are to be essentially antiphlogistic, and calculated to produce debility." A little reflection on the nature of the disease now before us will show that these principles are inapplicable both to the treatment of the valvular alterations, and of the hypertrophy of the left ventricle, which accompanies that alteration.

The disease we are considering is an inadequacy in the valvular apparatus at the mouth of the aorta permitting a regurgitation of blood into the ventricle. In the perfect state of the valvular apparatus at the mouth of the aorta, the valves support by intervals

the column of blood in the aorta, and the heart with its ordinary complement of fibre and of muscular strength, is with this assistance competent to the office it has to perform. But when, in consequence of a deficiency in the valvular apparatus, the heart does not receive its due share of assistance from these valves, and is obliged to perform not only its own function of propelling the blood, but has in addition to support after each contraction a portion of that weight of blood which should then be wholly supported by the valves, it is no longer in its ordinary state equal to the task imposed upon it. In such circumstances, nature, to enable the heart to perform the additional labour thrown on it, increases its strength by an addition of muscular fibre, and the heart thus becomes hypertrophied, in accordance with the general law, that muscular fibres become thickened and strengthened when there is additional power required from it. Is this hyper-trophy disease, or is it a wise provision of nature, by which the organ is thus made equal to the increased labour it has to per-form? On the answer depends the treatment to be adopted; and on this there is no room for hesitation. A heart of ordinary strength could not, under the circumstances, carry on the circulation; and nature then wisely endows the heart with the requisite degree of strength. It is at once obvious that to interfere with this wise provision of nature, to diminish the strength of the heart, or, if we choose other words, to direct, according to the advice of Laënnec, Bertin, etc. our measures against the hypertrophy of the organ, is to deprive the system of the only power which enables the heart to carry on the circulation. No one thinks of directing measures to diminish hypertrophy of the muscular tissue of the stomach, in narrowing of the pylorus from scirrhus of the bladder or, rectum in stricture of the urethra or intestines.

In these instances the hypertrophy is recognized as a provision of nature to make the power of the part equal to the obstacle it has to overcome; and yet, this simple principle seems to have been entirely overlooked in diseases of the heart, as if this organ possessed muscular fibres of a different nature from other organs, or as if, in adapting itself to obstacles affecting its action, it follows laws different from other muscular parts. The consequence of the neglect of this principle has been, that too often, in treatment of a valvular alteration in the heart, there has been a constant struggle between nature and medicine. Nature has been making the organ equal to its task; while medicine has been directed to counteract nature[s] efforts, and, by weakening the organ, to render it totally incapable of its task. The repeated bleedings, the starvings, the enforcement of debilitating measures, are totally unsuited to the disease we are considering.

Instead of such treatment, the measures most beneficial are those which by strengthening the general constitution, will give a proportionate degree of vigour to the muscular power of the heart, and thus enable it to carry on the circulation in the absence of that assistance which it ought to receive. With this view, a generous and sufficient diet of animal and vegetable food should be advised, at the same time that an abstinence from those beverages, such as malt liquors, which increase much the mass of the fluids, should be enjoined. It is not at all necessary that the patient should be prohibited from attending to his business or profession, provided that he do not devote to it so much attention as to produce debility. And as there is among patients who have

learned that they are afflicted with heart disease an universal dread of sudden death, it is necessary to undeceive them on this point; and in the present instance it can be done with perfect safety, as the termination of the disease is never sudden. This plan of treatment, opposite to what has been generally enjoined, was forced upon the attention long before the reasoning adduced here had been brought to support it.

One case may be mentioned, out of many that occurred, showing the bad effects of debilitating treatment in the disease before us, and exemplifying the evil of acting as if one principle were sufficient for guiding us in the treatment of all heart diseases. It is now several years since a consultation was held upon the case alluded to. This treatment ordered was in accordance with that generally recommended, consisting of repeated small bleedings, blistering, the exhibition of digitalis, and the most rigid regulation of diet, a total abstinence from animal food, and even a spare allowance of vegetables and milk. At the time the patient, a young man, was put under this treatment, he was not in an alarming state; but the disease being recognized as heart disease, he had the fortitude to submit to a course which he was led to expect held out a prospect of cure. Bleeding after bleeding, and blister after blister, were repeated, starvation enforced, and digitalis exhibited, until the patient was reduced to such weakness that he had scarcely strength to raise himself in bed. The local disease was all this time, however, growing worse; for the palpitation, cough, etc., were, from the slightest cause, increased to greater violence than previously to the commencement of treatment. The plan was, nevertheless, persevered in, until the patient's death being supposed at hand, this debilitating treatment was discontinued. From that hour the patient got better; and as muscular strength returned, the embarrasment of the breathing, palpitation, cough, etc., became less and less urgent. The patient is still alive, the disease is still present; but, with full living and good air, he is able not only to take considerable exercise, but even to undergo the fatigue of a business that constantly requires very laborious exertion.

Having laid down the plan of treatment proper to be adopted as far as it produces effects upon the system, and through it upon the heart constituting a part of the system, it now remains to examine the propriety of employing in this disease a remedy such as *digitalis,* which produces a specific effect upon the heart, rendering its action slow and weak, and which in consequence of that effect is usually recommended in cases of heart disease in conjunction with the measures already deprecated. In inadequacy of the aortic valves the pulse generally ranges from 90 to 110.

After each contraction of the ventricle during the pause or interval of rest occurring between that contraction and the next following, a quantity of blood is regurgitating into the ventricle. The danger of the disease is in proportion to the quantity of blood that regurgitates, and the quantity that regurgitates will be large in proportion to the degree of inadequacy of the valves, and to the length of pause between the contractions of the ventricle during which the blood can be pouring back. If the action of the heart be rendered very slow, the pause after each contraction will be long, and consequently the regurgitation of blood must be considerable. Frequent action of the heart, on the contrary, makes the pause after each contraction short; and in proportion as the

pauses are shortened, the regurgitation must be lessened. In-stead, then, of regarding an increase of frequency in the action of the heart as an aggravation of the disease, it must be viewed, as we have already viewed hypertrophy of the heart, as a provision for remedying as far as possible the evil consequences arising from inadequate valves. To retard in such circumstances the action of the heart would be to do an injury. In every case of this disease in which *digitalis* has been administered, it has invariably aggravated the patient's sufferings. The oppression has become greater; the action of the heart more laboured; the pulse intermittent, and very often dicrotic, from the heart's being unable by a single contraction to empty itself; general congestion and dropsy, if present, have been increased, and in some of the instances *bronchitis* from congestion has been induced; the respiration be-came laborious, and the strength so much sunk, that patients seemed almost moribund. From this state they only recovered by omitting the *digitalis,* and putting them on stimulants. In no case of this disease did *digitalis* produce the slightest good effect; and in all, the patients while under its exhibition were always worse.

A moderately quick pulse indeed is of itself no evil;, it is only an evil as an indication of some disease. In the present instance it is, however, an index of a positive good; it shows that the pauses between the contractions of the ventricle are short, and, consequently, that there is less danger of the quantity of blood thrown back upon the ventricle in the pause of its action, or intervals of rest, being of any considerable amount. The pulse, which in this disease ranges from 90 to 100, or even rises higher, is not to be interfered with merely because it is more frequent than natural.

The more frequent action of the ventricle indicated by that pulse is a safeguard against regurgitation. In this respect permanent patency of the aortic opening differs from narrowing of the auriculo-ventricular opening. In permanent patency, as already explained, frequent contractions and short pauses are the best safeguard against regurgitation. In narrowing of the auriculoventricular opening, on the contrary, slow action of the heart is an object of the first importance; for a slow action of the auricle will allow more time for the passage of the blood through the narrowed opening, and thus diminish the regurgitation upon the pulmonary veins and the lungs.

Although depleting measures and a lowering plan of treatment have been deprecated in the management of inadequacy of the aortic valves, and although the continued employment of such measures in cases of this disease instead of bringing relief, never fails to produce an aggravation of symptoms, there are, however, circumstances in which the most active treatment is called for. Inflammatory affections, congestions, etc., are more likely to occur in patients suffering from any obstacle to the circulation than in others, and whenever these supervene in patients labouring under inadequacy of the aortic valves, whether they be inflammatory affections or congestions of the thoracic or abdominal viscera, they call for the most prompt and active treatment. Instead of the heart affection inducing us to be less active in our treatment, it is a motive to be more prompt than in ordinary cases. It may be a fatal mistake to suppose that the presence of the heart disease is to make our measures less energetic. Pneumonia, peritonitis, acute rheumatism, have occurred in some of the cases that have been under observation, and

the patients have borne depletion even better than persons without any heart affection. It is a curious fact that, bleeding carried to a very large amount has never in these cases produced fainting. In this case the well established principle, that in acute diseases the more prompt and decided the measures, the more rapid will be the recovery of the patient, and the less troublesome the sequelae of the disease, should be our guide. The inflammatory affections that may incidentally occur in cases of inadequacy of the aortic valves, should be opposed with promptitude and decision; bleeding, when used, should be large; but when the inflammatory affection is once subdued, we should cease as soon as possible from debilitating treatment, which, if persevered in, will prove injurious to the organic affection. No details need be given of the measures to be adopted in those incidental affections, because they differ in no respect, except in energy from the usual treatment for the affection, whatever it may be, that has chanced to supervene. This active treatment on the occurrence of local inflammation is not at all incompatible with the course recommended to be followed when there is no disease present but the valvular inadequacy. Those incidental inflammatory or congestive affections will be rendered less likely to occur by the previous course of management recommended; for the greater vigour the system has enjoyed, the less danger there is of slight causes producing inflammation or congestion.

Lastly, there is besides the supervention of local inflammation or congestion, yet another circumstance, in which blood-letting may be required. Without the occurrence of any apparently adequate cause, straitness of chest, difficulty of breathing, tumultuous action of the heart, and a general feeling of nervous oppression are complained of. Neither pneumonia nor inflammatory action in any organ can be detected, and these symptoms seem to arise from an increase of bulk in the absolute mass of blood circulating, which keeps all the vessels so distended that the heart becomes oppressed, incapable of freely contracting, and tumultuous in its action. Relief is at once afforded by a large blood-letting, speedily followed by the exhibition of a full dose of an opiate. For the employment of the opiate, I am indebted to the suggestion of my colleague, Dr. Hunt, and its good effects are such as to have no substitute for it. The employment of a large bleeding in either of the circumstances here detailed, is very different from the repetition of those irritating small bleedings that are usually practised.

Fits of coughing are sometimes very troublesome in the couse of the disease, and where they arise from trifling bronchitis, they are best relieved by pectoral mixtures with a large proportion of opium, not less than four or five grains to an eight ounce mixture.

In these observations no medicine or treatment has been recommended with the view of acting directly on the aorta or valves, so as to restore in any degree the function of the latter. There is no medicine that can have any such power after the disease has been of much standing; and if the valves have become perforated or broken, it is obviously impossible to restore them to their original state. The disease is seldom seen in the commencement. Perhaps if seen early in those cases where it has followed an attack of rheumatism or where it partakes of an inflammatory character, the employment

of mercury pushed to salivation, and counter-irritation, might check the progress of the disease. In the advanced stages no good effect on the valvular affection has been produced by any or all of these measures.

Although the cure of *Inadequacy* of the Aortic Valves is probably out of the reach of medicine, a correct knowledge of the nature of the affection is not the less necessary. The patient is relieved from harrassing treatment, that, however, applicable in other cases of heart disease, is not alone useless, but positively injurious in this. In other affections of the heart there is a constant danger of sudden death from pulmonary apoplexy or hemorrhage, which may be induced even by ordinary exertion, and such danger keeps the patients in a state of perpetual terror. In this disease, on the contrary, assurance may be given against any sudden termination; and the patient may be permitted not only to attend to his business or profession, but may be assured, that, in leading a life of business and tolerable activity, he is adopting the very best means to prolong his life. Under treatment such as recommended, it is astonishing what little uneasiness inadequacy of the aortic valves will produce, indeed, very often not so much as those organic affections or growth of the liver, which are nevertheless viewed by the profession and by patients with much less terror.

13, Bachelor's Walk, Dublin.

* It may be objected to the phrase *flaccid,* that the arteries, being capable of contracting upon whatever quantity of blood they may contain, are never flaccid. In using the phrase, it is not meant that the sides of the arteries, like a collapsed vein, fall together, but merely that, having become emptied of some of their blood, in consequence of its regurgitation into the ventricle, they are, while in this state, less tense than when at the next diastole they are distended by a fresh supply of blood to their limit of extension.

* Corrigan, D. J.: Aneurism of the aorta: singular pulsation of the arteries, necessity of the employment of the stethoscope, Lancet I: 586-590, 1829. F. A. W., 1940.

* Laënnec has stated, and his assertion is supported by many, that the degree of impulse is always a correct index of hypertrophy of the ventricle, but it is now admitted by some most capable of judging, that the impulse of the heart is not to be considered a guage of the hypertrophy of the ventricle. Andral, in his *Clinique Medicale,* Vol. II, p. 160, says, "Plus d'une fois dans des cas ou apres la mort nous avons *trouvd les parois des ventricules Iris epaissies en tame temps que leurs cavites etaient notablement agrandies, nous n'avions reconnu pendant la vie aucune espice d'impulsion.* Dans d'autres cas ou it y avait simple hypertrophie due ventricule gauche, avec grande diminution de sa cavite (hypertrophie concentrique de MM. Bertin et Bouillaud,) it n'y avait pas eu non plus d'impulsion appreciable." Piorry *(Sur la Percussion,* p. 139) says, that impulse of the heart, carried even to raise the head of the observer, is far from being a constant sign of hypertrophy. Dr. Graves, in a clinical lecture *(vid.* Med. Gazette, March, 1831, p. 714.) says, "I can assert in the most positive manner, that I have seen cases of pneumonia in which the heart's pulsation continued violent until within a short time of dissolution; so much so indeed, as to induce the erroneous belief in myself and other medical attendants, that this organ was in a state of hypertrophy and dilatation,

and yet it was found after death to be in every respect healthy." This subject will be resumed at another time.

* The principles regulating the motion of fluids, already laid down, explain the production of *bruit de soufflet* in narrowed auriculo-ventricular opening. The blood at each contraction of the auricle dischargest itself from a narrow orifice into the ventricle, "a vessel of wider capacity not fully distended.", "The particles" of the blood "move in lines from the orifice, like so many radii tending to leave vacuum between them." This motion, as in the experiment of the tube, throws the sides of the ventricle into vibrations, which produce on the ear *bruit de soufflet,* and if the heart thus affected come forward so as to transmit through the parietes of the chest this vibrating motion the hand laid over the heart perceives a *fremissement,* or trembling in the organ, the *bruissement* of Corvisart.

* *Vide* Lancet for February 7th, 1829.

PERMANENT RETRACTION OF THE FINGERS PRODUCED BY AN AFFECTION OF THE PALMAR FASCIA

Baron Guillaume Dupuytren

Guillaume Dupuytren (1777-1835) was a well known French surgeon. Dupuytren was the first to realize that the lesion causing the retraction lay in the palmar fascia rather than the skin or tendons. These types of contractures had been reported earlier by Sir Astley Cooper (1768-1841) but Dupuytren's account and reports on seventeen cases led to the use of his name when describing the condition. His 1832 report was translated into English and published in 1833 by Alexandre Louis Michel Paillard and Edmond Marx. The report here that follows was published under the title: *CLINICAL LECTURES ON SURGERY, GIVEN AT THE HOTEL DIEU, PARIS* in the *Lancet*, Vol 2, pp. 222-225, in 1834. (White 2009)

Retraction of the fingers, Gentlemen, and particularly that of the ring-finger, has been observed for many years, but it was only very lately that the cause of this deformity has been investigated with success. If we consider the multitude of reasons assigned as a cause of this disease, the quantity of remedies proposed for its cure, and the various hypotheses put forth on its origin, it is not surprising that many surgeons should have regarded it as incur-able. Authors have spoken in a very incomplete manner upon this subject. Boyer, in his treatise on surgical diseases, has given to it a few words under the name, *erispatura tendinum.* Perhaps those who have more leisure may find some description of it in authors; if this be the case, I shall be happy to learn that those who have preceded me have discovered the cause and means of cure.

It has at different times been attributed to a rheumatismal affection, to gout, some external violence, a fracture, or the metastasis of some morbific cause, as we occasionally find in cases of inflammation of the sheaths or tendons of the flexor muscles; we shall see presently on what little foundation these pretended causes rest. The greater number of individuals affected by this disease have been obliged to make efforts with the palm of the hand, or frequently to handle hard bodies. Thus the wine-merchant and coachman of whom we shall presently speak were obliged, the one to perforate continually the casks with a gimlet, the other to ply his whip unceasingly on the backs of his jaded horses: it is also seen in masons who lift stones with the extremities of the fingers, in ploughmen, &c.; hence we see that the disease occurs most frequently in those who are forced in working

to make the palm of the hand *a point d'appui.* Individuals who are predisposed to the disease of which we speak, perceive that they extend the fingers of the injured hand with less facility than usual; the ring-finger soon begins to contract; the deformity first attacks the extreme phalanx, and the others follow its movement: as the disease advances, the finger becomes more contracted, and the flexion of the two neighbouring fingers begins to be re-marked. We do not feel any nodosity in front of the chord which runs along the palmar surface of the ring-finger; the two last phalanges are straight and movable at this period; and the last one is bent nearly at a right angle on the metacarpal bone, but still retains some motion; in this state it cannot be brought to its original position by the most violent effort. A person attacked by this infirmity attached to his finger a weight amounting to 150 pounds, without influencing in the least the degree of flexion. When the ring-finger is flexed to a great degree, the skin presents various folds, the concavity of which looks towards the articulation of the wrist. At first sight we might imagine that the skin was diseased, but dissection proves that the skin remains unaltered, and that the folds depend on adherences of the integument to the altered parts beneath. If we touch the palmar surface of the ring-finger, we find a tightly-stretched chord there; the summit of this chord is directed towards the extremity of the phalanx and it may be followed to the superior part of the palm of the hand; by flexing the finger this chord is made to disappear, and if we endeavour to extend it, we find that the tendon of the palmaris brevis is moved, and the motion propagated to the upper part of the palmar fascia; this effect depends on the continuity of these parts, and we shall have occasion presently to direct your attention more particularly to the circumstance.

But you may ask, what are the inconveniences of this affection? As the ring-finger cannot be extended, the motion of the two neighbouring fingers is much limited; the patient can only seize a very small body; if he attempt to grasp it strongly, he feels great pain; the very act of catching any body is painful. I have seen from thirty to forty examples of this disease, and have heard almost as many causes assigned to it. Some have regarded it as a thickening and contraction of the skin, not considering that the integument is drawn down on itself by the operation of the cause which produces the disease originally; others make it depend on a spasmodic contraction of the muscles; but this idea is purely hypothetical, for excepting extension, all the other movements of the finger are easily executed. The greater number of surgeons conceive this disease to be connected with some affection of the flexor tendons, and I myself adopted this view of the subject; but we still wanted to know the precise nature of the affection; was it inflammation, engorgement, adhesion of the cellular tissue, or some chronic disease of the parts?

Dissection alone could resolve these questions, which it did by showing that none of the presumed alterations existed. If we examine the articulations of the finger, we shall see that the surfaces are very extensive, and that they are united so as to favour flexion more than any other motion. The lateral ligaments, placed in either side of the joint, present a disposition which it is important to notice; they are placed closer to the anterior than to the posterior surface of the finger; hence the latter has a greater tendency to flexion than to extension. Such is an hypothesis that seems to have some

value, but it falls before facts which we shall presently adduce; besides, it cannot be applied with any show of reason to men in the height of youth. Finally, there are some surgeons who attribute the retraction of the fingers to a disease of the joint, which causes the ankylosis of the articulation.

Dissection of a Case

But let us not dwell any longer on these different suppositions, which I have merely noticed as they are connected with the history of the disease. The important thing to know is, that some obstacle exists, and that we ought to seek out its cause.

Such was a general view of our knowledge upon this point, when a man, who had been for a long time affected with this disease, happened to die. I had kept my eye on him for some years, and was determined not to lose this opportunity of investigation. Accordingly I possessed myself of the arm of this man, had the state of the parts accurately drawn by an artist, and then proceeded to dissect them. When the skin was removed from the palmar surface of the hand and fingers, the folds which I have before noticed, disappeared altogether. It was evident then that the folded arrangement of the skin during life depended on some other affection; but what was this? The dissection was continued by exposing the palmar fascia, and I was astonished to perceive that this fascia was tense, retracted, and shortened. From its lower portion were given off kinds of chords, which passed to the diseased finger. In flexing and extending the fingers, I could clearly see that the fascia underwent a sort of tension, or crackling; this was a trace of light, and made me suspect that the aponeurosis had some connexion with the complaint. But the precise point affected remained to be discovered. I cut through the prolongations extending from the fascia to the fingers; the state of contraction immediately ceased, and the slightest effort was sufficient to bring them to complete extension; the tendons were all sound, and the sheaths had not been opened; but in order to leave no doubt on the subject, I examined the tendons with care. Their surfaces were smooth, and they enjoyed their usual degree of motion; the joints also were in a healthy state, the bones were neither swollen nor changed in any degree. I could distinguish no alteration of the articular surfaces or ligaments. The synovial membranes, and synovial cartilages, all were sound. It was, therefore, natural to conclude that the disease commenced in an exaggerated tension of the palmar fascia, which depended on the violent or long-continued action of some hard body on the palm of the hand.

Treatment of the Affection., The various opinions held on the cause of this disease must of necessity have exercised great influence on the therapeutics. Many practitioners have thought that it was incurable. Dr. Bennati, having consulted Sir A. Cooper on the case of an Italian named Ferrari, who was affected with this deformity, was told by that celebrated surgeon that the disease was incurable. Others, while they admit the possibility of a cure, have proposed different methods, the great number of which alone is sufficient to prove their inefficacy. I have in my time treated a great number of patients successively with fumigations, cataplasms, leeches, and ointments, especially the mercurial. I have

employed alcaline douches, simple and sulphur douches, without any success. Finally, fatigued by being always defeated, I prescribed permanent extension, which also failed, having given rise to the excessive pain in the palm of the hand when the extension was long continued. Some surgeons had proposed the division of the flexor tendons, and this method was tried upon two occasions; in the middle, inflammation immediately set in, and the life of the patient was brought into danger. In the other case, the tendon was cut much lower down; no accident followed, but the finger remained as much flexed as ever. It was several years after these operations that I was consulted by Dr. Mailly for a similar case.

Cases of Contraction of the Ring and Little Fingers Completely Cured by Division of the Palmar Aponeurosis

Case 1.

In 1811, M. L., wine-merchant, having received from the South a great deal of wine, was desirous to assist his workmen in arranging the casks in the store. While endeavouring to raise one of the casks, which was very heavy, by placing his hand under the edge of the stave, he felt a sensation of cracking, and a slight pain in the palm of the hand. For some time the part remained stiff and sensible, but these symptoms soon went off, and he paid little attention to the state of his hand. The accident was nearly forgot-ten, when he perceived that the ring-finger commenced to contract towards the palm of the hand, and could not be extended as much as the other fingers. As there was no pain, he neglected this slight deformity. By degrees the disease advanced, and made a sensible progress each year, so that in 1831 the little and ring fingers were completely flexed, and applied to the palm of the hand; the second phalanx was folded on the first, and the extremity of the third applied to the middle of the ulnar edge of the palmar surface. The small finger was strongly flexed on the palm of the hand; and the skin of this part was folded, and dragged towards the retracted fingers.

The patient, annoyed by seeing this deformity getting daily worse, consulted several surgeons, who all said that the disease existed in the flexor tendons, and advised their section as the only remedy; but some would cut both tendons, whilst others pro-posed to divide only one. M. Mailly, being consulted in his turn, thought that the disease was probably situated in the flexor ten-dons, but advised the patient to see me on the subject. The moment I saw the man's hand I recognized the affection of the palmar fascia, declared the disease was not situated in the ten-dons, and that a few incisions practised in the aponeurosis would be sufficient to restore entire freedom of motion to the finger.

OPERATION:

The hand of the patient being firmly fixed, I commenced the operation by making a transverse incision nearly an inch long, opposite the metacarpo-phalyngean articulation of the ring finger; the bistoury divided first the skin and then the palmar fascia, with a crackling sound perceptible to the ear; after this incision the ring-finger recovered its

position and could be extended nearly as completely as ever. As I was desirous to spare the patient the pain of a new incision, I attempted to prolong the division of the fascia, by gliding the bistoury deeply under the skin towards the ulnar edge of the hand, in order to free, if possible, the little-finger, but this attempt failed. I was in consequence obliged to make another transverse incision opposite the articulation of the first and second phalanx of the little-finger, which enabled me to detach it from the palm of the hand, but the rest of the finger remained obstinately fixed towards this part. A new incision, however, divided the skin and fascia opposite the metacarpal joint of the finger, to give it some slight liberty; finally, a third transverse cut was made opposite the middle of the first phalanx, and immediately extension of the finger was easily accomplished; this proved clearly that the last incision had divided the point of insertion of the fascial process. The wounds were simply dressed with dry lint, and the fingers kept in a state of cxtension by a suitable apparatus.

PROGRESS OF THE CASE

Next day little pain; merely some uneasiness from the continued extension. On the following day the back of the hand was slightly oedematous from the pressure of the apparatus, which was clumsily made; another was applied, but the state of irritation continued, great pain set in, and the hand became much swollen. Not wishing to remove the machine applied to extend the fingers, I ordered the hand to be bathed continually with Goulard's solution, which gave considerable relief. On the 15th the lint was removed, and we found some little suppuration had set in; the hand was still swollen and painful. Extension was continued to the same degree as formerly, and the cold lotion applied. On the 16th the swelling had abated considerably, the fingers remained stiff, and suppuration was fully established. 17th. The symptoms were more favourable, and the extension could be increased somewhat without determining any pain. Finally, in the course of some days the swelling of the hand disappeared, and the wounds were healed on the 2nd of July.

The cause of this slowness in the cicatrization depended, with-out doubt, on the forced extension in which the fingers were constantly kept. The patient continued to carry the apparatus for another month, in order to oppose the reunion of the edges of the divided fascia; and when at length this was removed, we had the satisfaction of seeing that he could flex his fingers with facility, and that the stiffness which remained was only due to the forced extension in which the articulations were held for so long a time; but this rigidity disappeared when the patient had, for a short time, resumed his accustomed exercises.

REMARKS.

This case can leave no doubt of the nature of the disease; but we may be inclined to ask, how can the palmar fascia determine similar effects? To answer this question,

we must recall to your memory a few anatomical particulars concerning this fibrous envelope. The superficial palmar fascia is partly formed by the expansion of the tendon of the paltnaris brevis, and of the anterior portion of the annular ligament of the wrist. Though very strong at its origin, it thins by degrees, and sends off from its inferior margin four fibrous slips, which pass towards the inferior extremity of the four last metacarpal bones; here each of these slips bifurcates for the passage of the flexor tendons, and each branch of the bifurcated slip passes on to be attached to the *side,* and not to the front, of the phalanx, as most anatomists have thought. These are the slips of fascia which should be cut, whenever the operation becomes necessary. When we dissect off the skin from the fascia beneath, we find a certain difficulty in separating it, because the cellular tissue is dense, and because various fibrous filaments pass from the fascia into the integument; these adhesions explain readily the wrinkled state of the skin, and its motion. At first sight we might be inclined to dread cutting the nerves and vessles of the finger, but these parts are well protected by a kind of bridge formed by the contracted fibres, and run no risk of being divided.

The uses commonly attributed to the palmar fascia are to sustain the tendons of the flexor muscles, to strengthen the arch of the hand, and protect the different vessels and nerves there contained; but in addition to these, it tends constantly to bring the fingers to a state of demiflexion; which is their state of repose, and it is nothing more than the excess of this function, produced by disease, which gives rise to the deformity of which I now speak.

Case 2.

The subject of this operation was a coachman aged about 40. Several years back his fingers began to contract, especially the ring-finger. When he came to the Hotel Dieu, the fingers were so much flexed that they nearly touched the palm of the hand; and this part formed numerous folds of skin, the convexity of which was turned towards the fingers. When we attempted to extend the fingers, we felt a chord stretching from them to the palm of the hand; both hands were affected by the disease, which could not be mistaken, from its history, and the symptoms before us. When the hand was seized, and the fingers moved, the tension of the fascia became manifest; I immediately divided with a curved bistoury the skin and fascia by two incisions, one at the base of the ring-finger, in order to cut the two slips of fascia passing to it; the second at about an inch and a quarter below the other, in the palm of the hand, in order to divide this prolongation, a second time, and at the point where its base joined the palmar aponeurosis. After three incisions the ring-finger recovered very nearly its normal position; though little blood was lost, the patient felt himself weak, I therefore deferred operating on the left hand until another day. It is unnecessary to pursue the history of this case any further, as the treatment and success were exactly similar to the case already mentioned to you.

CONCLUDING REMARKS.

The facts which you have just heard, Gentlemen, establish, incontrovertibly, that retraction of the fingers depends, in these cases, on a retraction of the palmar fascia, and chiefly that part of it which is prolonged on the base of the fingers; and, finally, that this disease may be cured by the transverse sections of these slips, and of the fascia which furnishes them. These facts are not, indeed, sufficient to establish any general doctrine, but they will not fail to awaken the attention of practitioners; and it is, I hope, probable that these hints may become useful to science and humanity, in multiplying observations on the cause, symptoms, and treatment of this disease. But we should remark, that all analogous cases do not strictly resemble one another, that various methods of cure shall be applied to various diseases, and that the very best may lose their reputation by being applied without care or discrimination; such, for example, would be the fate of the method I have indicated, if it were employed against retraction of the fingers caused by gout, rheumatism, whitlow, or other similar diseases.

THE CONTAGIOUSNESS OF PUERPERAL FEVER

Oliver Wendell Holmes, M.D.

Oliver Wendell Holmes Sr.(1809-1894) was a medical literary giant and poet. He studied under Pierre Charles Alexandre Louis (1787-1872) at the famed École de Médecine in Paris. His report that follows is an important contribution to medicine. Holmes used his skills in clinical epidemiology to establish the contagious nature of puerperal fever and this was years before bacteriology had been developed. His paper was controversial but proven to be very accurate and his principles saved thousands of lives. The report as follows was published in *The New England Quarterly Journal of Medicine*, April, 1843 and later revisited and updated by Holmes in 1855 from reference Vol. XXXVIII, Part 5. The Harvard Classics. New York: P.F. Collier & Son, 1909. (White 2009)

Oliver Wendell Holmes Sr. was born in Cambridge, Massachusetts, August 29, 1809, and educated at Phillips Academy, Andover, and Harvard College. After graduation, he entered the Law School, but soon gave up law for medicine. He studied first in Boston, and later spent two years in medical schools in Europe, mainly in Paris. On his return he began to practice in Boston, but in two years he was appointed professor of anatomy at Dartmouth College, a position which he held from 1838 to 1840, when he again took up his Boston practice. It was soon after this, in 1843, that he published his essay on the Contagiousness of Puerperal Fever, his only contribution of high distinction to medical science. From 1847 to 1882 he was Parkman professor of anatomy and physiology in the Harvard Medical School. He died in Boston, October 7, 1894.

In spite of the importance of the paper here printed, Holmes's reputation as a scientist was overshadowed by that won by him as a wit and a man of letters. When he was only twenty-one his Old Ironsides brought him into notice; and through his poetry and fiction, and the sparkling talk of the Breakfast Table series, he took a high place among the most distinguished group of writers that America has yet produced.

The Contagiousness of Puerperal Fever

IN collecting, enforcing, and adding to the evidence accumulated upon this most serious subject, I would not be understood to imply that there exists a doubt in the mind of any well-informed member of the medical profession as to the fact that puerperal fever

is some-times communicated from one person to another, both directly and indirectly. In the present state of our knowledge upon this point I should consider such doubts merely as a proof that the sceptic had either not examined the evidence, or, having examined it, refused to accept its plain and unavoidable consequences. I should be sorry to think, with Dr. Rigby, that it was a case of "oblique vision"; I should be unwilling to force home the *argumentum ad hominem* of Dr. Blundell, but I would not consent to make a *question* of a momentous fact which is no longer to be considered as a subject for trivial discussions, but to be acted upon with silent promptitude. It signifies nothing that wise and experienced practitioners have sometimes doubted the reality of the danger in question; no man has the right to doubt it any longer. No negative facts, no opposing opinions, be they what they may, or whose they may, can form any answer to the series of cases now within the reach of all who choose to explore the records of medical science.

If there are some who conceive that any important end would be answered by recording such opinions, or by collecting the history of all the cases they could find in which no evidence of the influence of contagion existed, I believe they are in error. Suppose a few writers of authority can be found to profess a disbelief in contagion, and they are very few compared with those who think differently, is it quite clear that they formed their opinions on a view of all the facts, or is it not apparent that they relied mostly on their own solitary experience? Still further, of those whose names are quoted, is it not true that scarcely a single one could, by any possibility, have known the half or the tenth of the facts bearing on the subject which have reached such a frightful amount within the last few years? Again, as to the utility of negative facts, as we may briefly call them, instances, namely, in which exposure has not been followed by disease, although, like other truths, they may be worth knowing, I do not see that they are like to shed any important light upon the subject before us. Every such instance requires a good deal of circumstantial explanation before it can be accepted. It is not enough that a practitioner should have had a single case of puerperal fever not followed by others. It must be known whether he attended others while this case was in progress, whether he went directly from one chamber to others, whether he took any, and what, precautions. It is important to know that several women were exposed to infection derived from the patient, so that allowance may be made for want of predisposition. Now, if of negative facts so sifted there could be accumulated a hundred for every one plain instance of communication here recorded, I trust it need not be said that we are bound to guard and watch over the hundredth tenant of our fold, though the ninety and nine may be sure of escaping the wolf at its entrance. If any one is disposed, then, to take a hundred instances of lives endangered or sacrificed out of those I have mentioned, and make it reasonably clear that within a similar time and compass *ten thousand* escaped the same exposure, I shall thank him for his industry, but I must be permitted to hold to my own practical conclusions, and beg him to adopt or at least to examine them also. Children that walk in calico before open fires are not always burned to death; the instances to the contrary may be worth recording; but by no means if they are to be used as arguments against woollen frocks and high fenders.

I am not sure that this paper will escape another remark which it might be wished were founded in justice. It may be said that the facts are too generally known and acknowledged to require any formal argument or exposition, that there is nothing new in the positions advanced, and no need of laying additional statements before the profession. But on turning to two works, one almost universally, and the other extensively, appealed to as authority in this country, I see ample reason to overlook this objection. In the last edition of Dewees's Treatise on the "Diseases of Females" it is expressly said, "In this country, under no circumstance that puerperal fever has appeared hitherto, does it afford the slightest ground for the belief that it is contagious." In the "Philadelphia Practice of Midwifery" not one word can be found in the chapter devoted to this disease which would lead the reader to suspect that the idea of contagion had ever been entertained. It seems proper, therefore, to remind those who are in the habit of referring to these works for guidance that there may possibly be some sources of danger they have slighted or omitted, quite as important as a trifling irregularity of diet, or a confined state of the bowels, and that whatever confidence a physician may have in his own mode of treatment, his services are of questionable value whenever he carries the bane as well as the antidote about his person.

The practical point to be illustrated is the following: *The disease known as puerperal fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.*

Let me begin by throwing out certain incidental questions, which, without being absolutely essential, would render the subject more complicated, and by making such concessions and assumptions as may be fairly supposed to be without the pale of discussion.

It is granted that all the forms of what is called puerperal fever may not be, and probably are not, equally contagious or infectious. I do not enter into the distinctions which have been drawn by authors, because the facts do not appear to me sufficient to establish any absolute line of demarcation between such forms as may be propagated by contagion and those which are never so propagated. This general result I shall only support by the authority of Dr. Ramsbotham, who gives, as the result of his experience, that the same symptoms belong to what he calls the infectious and the sporadic forms of the disease, and the opinion of Armstrong in his original Essay. If others can show any such distinction, I leave it to them to do it. But there are cases enough that show the prevalence of the disease among the patients of a single practitioner when it was in no degree epidemic, in the proper sense of the term. I may refer to those of Mr. Roberton and of Dr. Peirson, hereafter to be cited, as examples.

I shall not enter into any dispute about the particular *mode* of infection, whether it be by the atmosphere the physician carries about him into the sick-chamber, or by the direct application of the virus to the absorbing surfaces with which his hand comes in contact. Many facts and opinions are in favor of each of these modes of transmission. But it is obvious that, in the majority of cases, it must be impossible to decide by which of these channels the disease is conveyed, from the nature of the intercourse between the physician and the patient.

It is not pretended that the contagion of puerperal fever must always be followed by the disease. It is true of all contagious diseases that they frequently spare those who appear to be fully submitted to their influence. Even the vaccine virus, fresh from the subject, fails every day to produce its legitimate effect, though every precaution is taken to insure its action. This is still more remarkably the case with scarlet fever and some other diseases.

It is granted that the disease may be produced and variously modified by many causes besides contagion, and more especially by epidemic and endemic influences. But this is not peculiar to the disease in question. There is no doubt that smallpox is propagated to a great extent by contagion, yet it goes through the same periods of periodical increase and diminution which have been remarked in puerperal fever. If the question is asked how we are to reconcile the great variations in the mortality of puerperal fever in different sea-sons and places with the supposition of contagion, I will answer it by another question from Mr. Farr's letter to the Registrar-General. He makes the statement that "*five* die weekly of smallpox in the metropolis when the disease is not epidemic," and adds, "The problem for solution is, Why do the five deaths become 10, 15, 20, 31, 58, 88, weekly, and then progressively fall through the same measured steps?"

I take it for granted that, if it can be shown that great numbers of lives have been and are sacrificed to ignorance or blindness on this point, no other error of which physicians or nurses may be occasionally suspected will be alleged in palliation of this; but that whenever and wherever they can be shown to carry disease and death instead of health and safety, the common instincts of humanity will silence every attempt to explain away their responsibility.

The treatise of Dr. Gordon, of Aberdeen, was published in the year 1795, being among the earlier special works upon the disease. A part of his testimony has been occasionally copied into other works, but his expressions are so clear, his experience is given with such manly distinctness and disinterested honesty, that it may be quoted as a model which might have been often followed with advantage.

"This disease seized such women only as were visited or delivered by a practitioner, or taken care of by a nurse, who had previously attended patients affected with the disease."

"I had evident proofs of its infectious nature, and that the infection was as readily communicated as that of the smallpox or measles, and operated more speedily than any other infection with which I am acquainted."

"I have evident proofs that every person who had been with a patient in the puerperal fever became charged with an atmosphere of infection, which was communicated to every pregnant woman who happened to come within its sphere. This is not an assertion, but a fact, admitting of demonstration, as may be seen by a perusal of the foregoing table referring to a table of seventy-seven cases, in many of which the channel of propagation was evident.

He adds: "It is a disagreeable declaration for me to mention, that I myself was the means of carrying the infection to a great number of women." He then enumerates

a number of instances in which the disease was conveyed by midwives and others to the neighboring villages, and declares that "these facts fully prove that the cause of the puerperal fever, of which I treat, was a specific contagion, or infection, altogether connected with a noxious constitution of the atmosphere."

But his most terrible evidence is given in these words:

> "I ARRIVED AT THAT CERTAINTY IN THE MATTER THAT I COULD VENTURE TO FORETELL WHAT WOMEN WOULD BE AFFECTED WITH THE DISEASE, UPON HEARING BY WHAT MIDWIFE THEY WERE TO BE DELIVERED, OR BY WHAT NURSE THEY WERE TO BE ATTENDED, DURING THEIR LYING-IN: AND AL-MOST IN EVERY INSTANCE MY PREDICTION WAS VERIFIED."

Even previously to Gordon, Mr. White, of Manchester, had said: "I am acquainted with two gentlemen in another town, where the whole business of midwifery is divided betwixt them, and it is very remarkable that one of them loses several patients every year of the puerperal fever, and the other never so much as meets with the disorder" a difference which he seems to attribute to their various modes of treatment.

Dr. Armstrong has given a number of instances in his Essay on Puerperal Fever of the prevalence of the disease among the patients of a single practitioner. At Sunderland, "in all, forty-three cases occurred from the 1st of January to the 1st of October, when the disease ceased; and of this number, forty were witnessed by Mr. Gregson and his assistant, Mr. Gregory, the remainder having been separately seen by three accoucheurs. There is appended to the London edition of this Essay a letter from Mr. Gregson, in which that gentleman says, in reference to the great number of cases occurring in his practice, "The cause of this I cannot pretend fully to explain, but I should be wanting in common liberality if I were to make any hesitation in asserting that the disease which appeared in my practice was highly contagious, and communicable from one puerperal woman to another." "It is customary among the lower and middle ranks of people to make frequent personal visits to puerperal women resident in the same neighborhood, and I have ample evidence for affirming that the infection of the disease was often carried about in that manner; and, however painful to my feelings, I must in candor declare that it is very probable the contagion was conveyed, in some instances, by myself, though I took every possible care to prevent such a thing from happening the moment that I ascertained that the distemper was infectious." Dr. Armstrong goes on to mention six other instances within his knowledge, in which the disease had at different times and places been limited, in the same singular manner, to the practice of individuals, while it existed scarcely, if at all, among the patients of others around them. Two of the gentlemen became so convinced of their conveying the contagion that they withdrew for a time from practice.

I find a brief notice, in an American journal, of another series of cases, first mentioned by Mr. Davies, in the "Medical Repository." This gentleman stated his conviction that the disease is contagious.

"In the autumn of 1822 he met with twelve cases, while his medical friends in the neighborhood did not meet with any, or at least very few.' He could attribute this circumstance to no other cause than his having been present at the examination, after death, of two cases, some time previous, and of his having imparted the disease to his patients, notwithstanding every precaution."

Dr. Gooch says; "It is not uncommon for the greater number of cases to occur in the practice of one man, whilst the other practitioners of the neighborhood, who are not more skilful or more busy, meet with few or none. A practitioner opened the body of a woman who had died of puerperal fever, and continued to wear the same clothes. A lady whom he delivered a few days afterwards was attacked with and died of a similar disease; two more of his lying-in patients, in rapid succession, met with the same fate; struck by the thought that he might have carried contagion in his clothes, he instantly changed them, and met with no more cases of the kind.' A woman in the country who was employed as washerwoman and nurse washed the linen of one who had died of puerperal fever; the next lying-in patient she nursed died of the same disease; a third nursed by her met with the same fate, till the neighborhood, getting afraid of her, ceased to employ her." 4

In the winter of the year 1824, "several instances occurred of its prevalence among the patients of particular practitioners, whilst others who were equally busy met with few or none. One instance of this kind was very remarkable. A general practitioner, in large midwifery practice, lost so many patients from puerperal fever that he determined to deliver no more for some time, but that his partner should attend in his place. This plan was pursued for one month, during which not a case of the disease occurred in their practice. The elder practitioner, being then sufficiently recovered, returned to his practice, but the first patient he attended was attacked by the disease and died. A physician who met him in consultation soon afterwards, about a case of a different kind, and who knew nothing of his misfortune, asked him whether puerperal fever was at all prevalent in his neighborhood, on which he burst into tears, and related the above circumstances.

"Among the cases which I saw this season in consultation, four occurred in one month in the practice of one medical man, and all of them terminated fatally."'

Dr. Ramsbotham asserted, in a lecture at the London Hospital, that he had known the disease spread through a particular district, or be confined to the practice of a particular person, almost every patient being attacked with it, while others had not a single case. It seemed capable, he thought, of conveyance, not only by common modes, but through the dress of the attendants upon the patient.'

In a letter to be found in the "London Medical Gazette" for January, 1840, Mr. Roberton, of Manchester, makes the statement which I here give in a somewhat condensed form.

A midwife delivered a woman on the 4th of December, 1830, who died soon after with the symptoms of puerperal fever. In one month from this date the same midwife delivered thirty women, residing in different parts of an extensive suburb, of which number sixteen caught the disease and all died. These were the only cases which had

occurred for a considerable time in Manchester. The other midwives connected with the same charitable institution as the woman already mentioned are twenty-five in number, and deliver, on an average, ninety women a week, or about three hundred and eighty a month. None of these women had a case of puerperal fever. "Yet all this time this woman was crossing the other midwives in every direction, scores of the patients of the charity being delivered by them in the very same quarters where her cases of fever were happening."

Mr. Roberton remarks that little more than half the women she delivered during this month took the fever; that on some days all escaped, on others only one or more out of three or four: a circumstance similar to what is seen in other infectious maladies.

Dr. Blundell says: "Those who have never made the experiment can have but a faint conception how difficult it is to obtain the exact truth respecting any occurrence in which feelings and interests are concerned. Omitting particulars, then, I content myself with re-marking, generally, that from more than one district I have received accounts of the prevalence of puerperal fever in the practice of some individuals, while its occurrence in that of others, in the same neighborhood, was not observed. Some, as I have been told, have lost ten, twelve, or a greater number of patients, in scarcely broken succession; like their evil genius, the puerperal fever has seemed to stalk behind them wherever they went. Some have deemed it prudent to retire for a time from practice. In fine, that this fever may occur spontaneously, I admit; that its infectious nature may be plausibly disputed, I do not deny; but I add, considerately, that in my own family I had rather that those I esteemed the most should be de-livered, unaided, in a stable, by the mangerside, than that they should receive the best help, in the fairest apartment, but exposed to the vapors of this pitiless disease. Gossiping friends, wet-nurses, monthly nurses, the practitioner himself, these are the channels by which, as I suspect, the infection is principally conveyed."'

At a meeting of the Royal Medical and Chirurgical Society Dr. King mentioned that some years since a practitioner at Woolwich lost sixteen patients from puerperal fever in the same year. He was compelled to give up practice for one or two years, his business being divided among the neighboring practitioners. No cases of puerperal fever occurred afterwards, neither had any of the neighboring surgeons any cases of this disease.

At the same meeting Mr. Hutchinson mentioned the occurrence of three consecutive cases of puerperal fever, followed subsequently by two others, all in the practice of one accoucheur.[9]

Dr. Lee makes the following statement: "In the last two weeks of September, 1827, five fatal cases of uterine inflammation came under our observation. All the individuals so attacked had been attended in labor by the same midwife, and no example of a febrile or inflammatory disease of a serious nature occurred during that period among the other patients of the Westminster General Dispensary, who had been attended by the other midwives belonging to that institution. "[9]

The recurrence of long series of cases like those I have cited, reported by those most interested to disbelieve in contagion, scattered along through an interval of half a

century, might have been thought sufficient to satisfy the minds of all inquirers that here was something more than a singular coincidence. But if, on a more extended observation, it should be found that the same ominous groups of cases clustering about individual practitioners were observed in a remote country, at different times, and in widely separated regions, it would seem incredible that any should be found too prejudiced or indolent to accept the solemn truth knelled into their ears by the funeral bells from both sides of the ocean the plain conclusion that the physician and the disease entered, hand in hand, into the chamber of the unsuspecting patient.

That such series of cases have been observed in this country, and in this neighborhood, I proceed to show.

In Dr. Francis[8] "Notes to Denman's Midwifery" a passage is cited from Dr. Hosack in which he refers to certain puerperal cases which proved fatal to several lying-in women, and in some of which the disease was supposed to be conveyed by the accoucheurs them-selves. 10

A writer in the "New York Medical and Physical Journal" for October, 1829, in speaking of the occurrence of puerperal fever confined to one man's practice, remarks: "We have known cases of this kind occur, though rarely, in New York."

I mention these little hints about the occurrence of such cases partly because they are the first I have met with in American medical literature, but more especially because they serve to remind us that behind the fearful array of published facts there lies a dark list of similar events, unwritten in the records of science, but long remembered by many a desolated fireside.

Certainly nothing can be more open and explicit than the account given by Dr. Peirson, of Salem, of the cases seen by him. In the first nineteen days of January, 1829, he had five consecutive cases of puerperal fever, every patient he attended being attacked, and the three first cases proving fatal. In March of the same year he had two moderate cases, in June, another case, and in July, another, which proved fatal. "Up to this period," he remarks, "I am not informed that a single case had occurred in the practice of any other physician. Since that period I have had no fatal case in my practice, although I have had several dangerous cases. I have attended in all twenty cases of this disease, of which four have been fatal. I am not aware that there has been any other case in the town of distinct puerperal peritonitis, although I am willing to admit my information may be very defective on this point. I have been told of some `mixed cases,' and `morbid affections after delivery.' "11

In the "Quarterly Summary of the Transactions of the College of Physicians of Philadelphia"1E may be found some most extraordinary developments respecting a series of cases occurring in the practice of a member of that body.

Dr. Condie called the attention of the Society to the prevalence, at the present time, of puerperal fever of a peculiarly insidious and malignant character. "In the practice of one gentleman extensively engaged as an obstetrician nearly every female he has attended in confinement, during several weeks past, within the above limits" (the southern sections and neighboring districts), "had been attacked by the fever."

"An important query presents itself, the doctor observed, in reference to the particular form of fever now prevalent. Is it, namely, capable of being propagated by contagion, and is a physician who has been in attendance upon a case of the disease warranted in continuing, without interruption, his practice as an obstetrician? Dr. C., although not a believer in the contagious character of many of those affections generally supposed to be propagated in this manner, has, nevertheless, become convinced by the facts that have fallen under his notice that the puerperal fever now prevailing is capable of being communicated by contagion. How, otherwise, can be explained the very curious circumstance of the disease in one district being exclusively confined to the practice of a single physician, a Fellow of this College, extensively engaged in obstetrical practice, while no in-stance of the disease has occurred in the patients under the care of any other accoucheur practising within the same district; scarcely a female that has been delivered for weeks past has escaped an attack?"

Dr. Rutter, the practitioner referred to, "observed that, after the occurrence of a number of cases of the disease in his practice, he had left the city and remained absent for a week, but, on returning, no article of clothing he then wore having been used by him before, one of the very first cases of parturition he attended was followed by an attack of the fever and terminated fatally; he cannot readily, there-fore, believe in the transmission of the disease from female to female in the person or clothes of the physician."

The meeting at which these remarks were made was held on the 3d of May, 1842. In a letter dated December 20, 1842, addressed to Dr. Meigs, and to be found in the "Medical Examiner,"13 he speaks of "those horrible cases of puerperal fever, some of which you did me the favor to see with me during the past summer," and talks of his experience in the disease, "now numbering nearly seventy cases, all of which have occurred within less than a twelve-month past."

And Dr. Meigs asserts, on the same page, "Indeed, I believe that his practice in that department of the profession was greater than that of any other gentleman, which was probably the cause of his seeing a greater number of the cases." This from a professor of midwifery, who some time ago assured a gentleman whom he met in consultation that the night on which they met was the eighteenth in succession that he himself had been summoned from his repose," seems hardly satisfactory.

I must call the attention of the inquirer most particularly to the Quarterly Report above referred to, and the letters of Dr. Meigs and Dr. Rutter, to be found in the "Medical Examiner." Whatever impression they may produce upon his mind, I trust they will at least convince him that there is some reason for looking into this apparently uninviting subject.

At a meeting of the College of Physicians just mentioned Dr. Warrington stated that a few days after assisting at an autopsy of puerperal peritonitis, in which he laded out the contents of the abdominal cavity with his hands, he was called upon to deliver three women in rapid succession. All of these women were attacked with different forms of what is commonly called puerperal fever. Soon after these he saw two other patients, both on the same day, with the same disease. Of these five patients, two died.

At the same meeting Dr. West mentioned a fact related to him by Dr. Samuel Jackson, of Northumberland. Seven females, delivered by Dr. Jackson in rapid succession, while practising in Northumberland County, were all attacked with puerperal fever, and five of them died. "Women," he said, "who had expected me to attend upon them, now becoming alarmed, removed out of my reach, and others sent for a physician residing several miles distant. These women, as well as those attended by midwives, all did well; nor did we hear of any deaths in child-bed within a radius of fifty miles, excepting two, and these I afterwards ascertained to have been caused by other diseases." He underwent, as he thought, a thorough purification, and still his next patient was attacked with the disease and died. He was led to suspect that the contagion might have been carried in the gloves which he had worn in attendance upon the previous cases. Two months or more after this he had two other cases. He could find nothing to account for these unless it were the instruments for giving enemata, which had been used in two of the former cases and were employed by these patients. When the first case occurred, he was attending and dressing a limb extensively mortified from erysipelas, and went immediately to the accouchement with his clothes and gloves most thoroughly imbued with its effluvia. And here I may mention that this very Dr. Samuel Jackson, of Northumberland, is one of Dr. Dewees[§] authorities against contagion.

The three following statements are now for the first time given to the public. All of the cases referred to occurred within this State, and two of the three series in Boston and its immediate vicinity.

I. The first is a series of cases which took place during the last spring in a town at some distance from this neighborhood. A physician of that town, Dr. C., had the following consecutive cases:

> These were the only cases attended by this physician during the period referred to. "They were all attended by him until their termination, with the exception of the patient No. 6, who fell into the hands of another physician on the 2d of May." (Dr. C. left town for a few days at this time.) Dr. C. attended cases immediately before and after the above-named periods, none of which, however, presented any peculiar symptoms of the disease.

About the 1st of July he attended another patient in a neighboring village, who died two or three days after delivery.

The first patient, it is stated, was delivered on the 20th of March. "On the 19th Dr. C. made the autopsy of a man who died suddenly, sick only forty-eight hours; had oedema of the thigh and gangrene extending from a little above the ankle into the cavity of the abdomen." Dr. C. wounded himself very slightly in the right hand during the autopsy. The hand was quite painful the night following, during his attendance on the patient No. 1. He did not see this patient after the 20th, being confined to the house, and very sick from the wound just mentioned, from this time until the 3d of April.

Several cases of erysipelas occurred in the house where the autopsy mentioned above took place, soon after the examination. There were also many cases of erysipelas in town at the time of the fatal puerperal cases which have been mentioned.

The nurse who laid out the body of the patient No. 3 was taken on the evening of the same day with sore throat and erysipelas, and died in ten days from the first attack.

The nurse who laid out the body of the patient No. 4 was taken on the day following with symptoms like those of this patient, and died in a week, without any external marks of erysipelas.

"No other cases of similar character with those of Dr. C. occurred in the practice of any of the physicians in the town or vicinity at the time. Deaths following confinement have occurred in the practice of other physicians during the past year, but they were not cases of puerperal fever. No post-mortem examinations were held in any of these puerperal cases."

Some additional statements in this letter are deserving of insertion:

"A physician attended a woman in the immediate neighborhood of the cases numbered 2, 3, and 4. This patient was confined the morning of March 1st, and died on the night of March 7th. It is doubtful whether this should be considered a case of puerperal fever. She had suffered from canker, indigestion, and diarrhoea for a year previous to her delivery. Her complaints were much aggravated for two or three months previous to delivery; she had become greatly emaciated, and weakened to such an extent that it had not been expected that she would long survive her confinement, if indeed she reached that period. Her labor was easy enough; she flowed a good deal, seemed exceedingly prostrated, had ringing in the ears, and other symptoms of exhaustion; the pulse was quick and small. On the second and third day there was some tenderness and tumefaction of the abdomen, which increased somewhat on the fourth and fifth. He had cases in midwifery before and after this, which presented nothing peculiar."

It is also mentioned in the same letter that another physician had a case during the last summer and another last fall, both of which recovered.

Another gentleman reports a case last December, a second case five weeks, and another three weeks, since. All these recovered. A case also occurred very recently in the practice of a physician in the village where the eighth patient of Dr. C. resides, which proved fatal. "This patient had some patches of erysipelas on the legs and arms. The same physician has delivered three cases since, which have all done well. There have been no other cases in this town or its vicinity recently. There have been some few cases of erysipelas." It deserves notice that the partner of Dr. C. who attended the autopsy of the man above mentioned and took an active part in it, who also suffered very slightly from a prick under the thumb-nail received during the examination, had twelve cases of midwifery between March 26th and April 12th, all of which did well, and presented no peculiar symptoms. It should also be stated that during these seven-teen days he was in attendance on all the cases of erysipelas in the house where the autopsy had been performed. I owe these facts to the prompt kindness of a gentleman whose intelligence and character are sufficient guaranty for their accuracy.

The two following letters were addressed to my friend Dr. Storer by the gentleman in whose practice the cases of puerperal fever occurred. His name renders it unnecessary to refer more particularly to these gentlemen, who on their part have manifested the most perfect freedom and courtesy in affording these accounts of their painful experience.

January 28, 1843.

II . . . . "The time to which you allude was in 1830. The first case was in February, during a very cold time. She was confined the 4th, and died the 12th. Between the 10th and 28th of this month I attended six women in labor, all of whom did well except the last, as also two who were confined March 1st and 5th. Mrs. E., confined February 28th, sickened, and died March 8th. The next day, 9th, I inspected the body, and the night after attended a lady, Mrs. B. , who sickened, and died the 16th. The 10th, I attended another, Mrs. G., who sickened, but recovered. March 16th I went from Mrs. G.'s room to attend a Mrs. H., who sickened, and died 21st. The 17th, I inspected Mrs. B. On the 19th, I went directly from Mrs. H.[§] room to attend another lady, Mrs. G., who also sickened, and died 22d. While Mrs. B. was sick, on 15th, I went directly from her room a few rods, and attended another woman, who was not sick. Up to 20th of this month I wore the same clothes. I now refused to attend any labor, and did not till April 21st, when, having thoroughly cleansed myself, I resumed my practice, and had no more puerperal fever.

"The cases were not confined to a narrow space. The two nearest were half a mile from each other, and half that distance from my residence. The others were from two to three miles apart, and nearly that distance from my residence. There were no other cases in their immediate vicinity which came to my knowledge. The general health of all the women was pretty good, and all the labors as good as common, except the first. This woman, in consequence of my not arriving in season, and the child being half-born at some time before I arrived, was very much exposed to the cold at the time of confinement, and afterwards, being confined in a very open, cold room. Of the six cases, you perceive only one recovered.

In the winter of 1817 two of my patients had puerperal fever, one very badly, the other not so badly. Both recovered. One other had swelled leg, or phlegmasia dolens, and one or two others did not recover as well as usual.

"In the summer of 1853 another disastrous period occurred in my practice. July 1st I attended a lady in labor, who was afterwards quite ill and feverish; but at the time I did not consider her case a decided puerperal fever. On the 8th I attended one who did well. On the 12th, one who was seriously sick. This was also an equivocal case, apparently arising from constipation and irritation of the rectum. These women were ten miles apart and five from my residence. On 15th and 20th two who did well. On 25th I attended another. This was a severe labor, and followed by unequivocal puerperal fever, or peritonitis. She recovered. August 2d and 3d, in about twenty-four hours, I attended four persons. Two of them did very well; one was attacked with some of the common symptoms, which, however, subsided in a day or two, and the other had decided puerperal fever, but recovered. This woman resided five miles from me. Up to this time I wore

the same coat. All my other clothes had frequently been changed. On 6th, I attended two women, one of whom was not sick at all; but the other, Mrs. L., was afterwards taken ill. On 10th, I attended a lady, who did very well. I had previously changed all my clothes, and had no garment on which had been in a puerperal room. On 12th, I was called to Mrs. S., in labor. While she was ill, I left her to visit Mrs. L., one of the ladies who was confined on 6th. Mrs. L. had been more unwell than usual, but I had not considered her case anything more than common till this visit. I had on a surtout at this visit, which, on my return to Mrs. S., I left in another room. Mrs. S. was delivered on 13th with forceps. These women both died of decided puerperal fever.

"While I attended these women in their fevers I changed my clothes, and washed my hands in a solution of chloride of lime after each visit. I attended seven women in labor during this period, all of whom recovered without sickness.

"In my practice I have had several single cases of puerperal fever, some of whom have died and some have recovered. Until the year 1830 I had no suspicion that the disease could be communicated from one patient to another by a nurse or midwife; but I now think the foregoing facts strongly favor that idea. I was so much convinced of this fact that I adopted the plan before related.

"I believe my own health was as good as usual at each of the above periods. I have no recollection to the contrary.

"I believe I have answered all your questions. I have been more particular on some points perhaps than necessary; but I thought you could form your own opinion better than to take mine. In 1830 I wrote to Dr. Channing a more particular statement of my cases. If I have not answered your questions sufficiently, perhaps Dr. C. may have my letter to him, and you can find your answer there."

BOSTON, February 3, 1843.

III. "My DEAR SIR: I received a note from you last evening requesting me to answer certain questions therein proposed, touching the cases of puerperal fever which came under my observation the past summer. It gives me pleasure to comply with your request, so far as it is in my power *so* to do, but, owing to the hurry in preparing for a journey, the notes of the cases I had then taken were lost or mislaid. The principal *facts,* however, are too vivid upon my recollection to be soon forgotten. I think, therefore, that I shall be able to give you all the information you may require.

"All the cases that occurred in my practice took place between the 7th of May and the 17th of June, 1842.

"They were not confined to any particular part of this city. The first two cases were patients residing at the South End, the next was at the extreme North End, one living in Sea Street and the other in Roxbury. The following is the order in which they occurred:

"CASE 1.Mrs. was confined on the 7th of May, at 5 o'clock, P.M., after a natural labor of six hours. At 12 o'clock at night, on the 9th (thirty-one hours after confinement),

she was taken with severe chill, previous to which she was as comfortable as women usually are under the circumstances. She died on the 10th.

"CASE 2. Mrs.—was confined on the 10th of June (four weeks after Mrs. C.), at 11 A.M., after a natural, but somewhat severe, labor of five hours. At 7 o'clock, on the morning of the 11th, she had a chill. Died on the 12th.

"CASE 3., Mrs—, confined on the 14th of June, was comfortable until the 18th, when symptoms of puerperal fever were manifest. She died on the 20th.

"CASE 4., Mrs. , confined June 17th, at 5 o'clock, A. M., was doing well until the morning of the 19th. She died on the evening of the 21st.

"CASE 5., Mrs., was confined with her *fifth* child on the 17th of June, at 6 o'clock in the evening. This patient had been attacked with puerperal fever, at three of her previous confinements, but the disease yielded to depletion and other remedies without difficulty. This time, I regret to say,.I was not so fortunate. She was not attacked, as were the other patients, with a chill, but complained of extreme pain in abdomen, and tenderness on pressure, almost from the moment of her confinement. In this, as in the other cases, the disease resisted all remedies, and she died in great distress on the 22d of the same month. Owing to the extreme heat of the season and my own indisposition, none of the subjects were examined after death. Dr. Channing, who was in attendance with me on the three last cases, proposed to have a *post-mortem* examination of the subject of case No. 5, but from some cause which I do not now recollect it was not obtained.

"You wish to know whether I wore the same clothes when attending the different cases. I cannot positively say, but I should think I did not, as the weather became warmer after the first two cases; I therefore think it probable that I made a change of at least a *part* of my dress. I have had no other case of puerperal fever in my own practice for three years, save those above related, and I do not remember to have lost a patient before with this disease. While absent, last July, I visited two patients sick with puerperal fever, with a friend of mine in the country. Both of them recovered.

"The cases that I have recorded were not confined to any particular constitution or temperament, but it seized upon the strong and the weak, the old and the young, one being over forty years, and the youngest under eighteen years of age . . . . If the disease is of an erysipelatous nature, as many suppose, contagionists may perhaps find some ground for their belief in the fact that, for two weeks previous to my first case of puerperal fever, I had been attending a severe case of erysipelas, and the infection may have been conveyed through me to the patient; but, on the other hand, why is not this the case with other physicians, or with the same physician at all times, for since my return from the country I have had a more inveterate case of erysipelas than ever before, and no difficulty whatever has attended any of my midwifery cases?"

I am assured, on unquestionable authority, that "about three years since a gentleman in extensive midwifery business, in a neighboring State, lost in the course of a few weeks eight patients in child-bed, seven of them being undoubted cases of puerperal fever. No other physician of the town lost a single patient of this disease during the same period." And from what I have heard in conversation with some of our most experienced practitioners, I am inclined to think many cases of the kind might be brought to light by extensive inquiry.

This long catalogue of melancholy histories assumes a still darker aspect when we remember how kindly nature deals with the parturient female, when she is not immersed in the virulent atmosphere of an impure lying-in hospital, or poisoned in her chamber by the unsuspected breath of contagion. From all causes together not more than four deaths in a thousand births and miscarriages happened in England and Wales during the period embraced by the first Report of the Registrar-General.[16] In the second Report the mortality was shown to be about five in one thousand.17 In the Dublin Lying-in Hospital, during the seven years of Dr. Collins[§] mastership, there was one case of puerperal fever to 178 deliveries, or less than six to the thousand, and one death from this disease in 278 cases, or between three and four to the thousand.[19] Yet during this period the disease was endemic in the hospital, and might have gone on to rival the horrors of the pestilence of the Maternite, had not the poison been destroyed by a thorough purification.

In private practice, leaving out of view the cases that are to be ascribed to the self-acting system of propagation, it would seem that the disease must be far from common. Mr. White, of Manchester, says: "Out of the whole number of lying-in patients whom I have delivered (and I may safely call it a great one), I have never lost one, nor to the best of my recollection has one been greatly endangered, by the puerperal, miliary, low nervous, putrid malignant, or milk fever. "1[9] Dr. Joseph Clarke informed Dr. Collins that in the course of *forty-five* years' most extensive practice he lost but *four* patients from this disease.[20] One of the most eminent practitioners of Glasgow who has been engaged in very extensive practice for upwards of a quarter of a century testifies that he never saw more than twelve cases of real puerperal fever.E1

I have myself been told by two gentlemen practising in this city, and having for many years a large midwifery business, that they had neither of them lost a patient from this disease, and by one of them that he had only seen it in consultation with other physicians. In five hundred cases of midwifery, of which Dr. Storer has given an abstract in the first number of this journal, there was only one instance of fatal puerperal peritonitis.

In the view of these facts it does appear a singular coincidence that one man or woman should have ten, twenty, thirty, or seventy cases of this rare disease following his or her footsteps with the keenness of a beagle, through the streets and lanes of a crowded city, while the scores that cross the same paths on the same errands know it only by name. It is a series of similar coincidences which has led us to consider the dagger, the musket, and certain innocent-looking white powders as having some little claim to be regarded as dangerous. It is the practical inattention to similar coincidences which has given rise to the unpleasant but often necessary documents called *indictments,* which

has sharpened a form of the cephalotome sometimes employed in the case of adults, and adjusted that modification of the fillet which delivers the world of those who happen to be too much in the way while such striking coincidences are taking place.

I shall now mention a few instances in which the disease appears to have been conveyed by the process of direct inoculation.

Dr. Campbell, of Edinburgh, states that in October, 1821, he assisted at the post-mortem examination of a patient who died with puerperal fever. He carried the pelvic viscera in his pocket to the class-room. The same evening he attended a woman in labor without previously changing his clothes; this patient died. The next morning he delivered a woman with the forceps; she died also, and of many others who were seized with the disease within a few weeks, three shared the same fate in succession.

In June, 1823, he assisted some of his pupils at the autopsy of a case of puerperal fever. He was unable to wash his hands with proper care, for want of the necessary accommodations. On getting home he found that two patients required his assistance. He went without further ablution or changing his clothes; both these patients died with puerperal fever.22 This same Dr. Campbell is one of Dr. Churchill's authorities against contagion.

Mr. Roberton says that in one instance within his knowledge a practitioner passed the catheter for a patient with puerperal fever late in the evening; the same night he attended a lady who had the symptoms of the disease on the second day. In another instance a surgeon was called while in the act of inspecting the body of a woman who had died of this fever, to attend a labor; within forty-eight hours this patient was seized with the fever.23

On the 16th of March, 1831, a medical practitioner examined the body of a woman who had died a few days after delivery, from puerperal peritonitis. On the evening of the 17th he delivered a patient, who was seized with puerperal fever on the 19th, and died on the 24th. Between this period and the 6th of April the same practitioner attended two other patients, both of whom were attacked with the same disease and died.'

In the autumn of 1829 a physician was present at the examination of a case of puerperal fever, dissected out the organs, and assisted in sewing up the body. He had scarcely reached home when he was summoned to attend a young lady in labor. In sixteen hours she was attacked with the symptoms of puerperal fever, and narrowly escaped with her life.25

In December 1830, a midwife, who had attended two fatal cases of puerperal fever at the British Lying-in Hospital, examined a patient who had just been admitted, to ascertain if labor had commenced. This patient remained two days in the expectation that labor would come on, when she returned home and was then suddenly taken in labor and delivered before she could set out for the hospital. She went on favorably for two days, and was then taken with puerperal fever and died in thirty-six hours.%

"A young practitioner, contrary to advice, examined the body of a patient who had died from puerperal fever; there was no epidemic at the time; the case appeared to be purely sporadic. He delivered three other women shortly afterwards; they all died with

puerperal fever, the symptoms of which broke out very soon after labor. The patients of his colleague did well, except one, where he assisted she was attacked in the same manner as those whom he had attended, and died also." The writer in the "British and Foreign Medical Review," from whom I quote this statement, and who is no other than Dr. Rigby, adds: "We trust that this fact alone will forever silence such doubts, and stamp the well-merited epithet of 'criminal,' as above quoted, upon such attempts. "r"

From the cases given by Mr. Ingleby I select the following: Two gentlemen, after having been engaged in conducting the *post-mortem* examination of a case of puerperal fever, went in the same dress, each respectively, to a case of midwifery. "The one patient was seized with the rigor about thirty hours afterwards. The other patient was seized with a rigor the third morning after delivery. *One recovered, one died.* "28 One of these same gentlemen attended another woman in the same clothes two days after the autopsy referred to. "The rigor did not take place until the evening of the fifth day from the first visit. *Result fatal."* These cases belonged to a series of seven, the first of which was thought to have originated in a case of erysipelas. "Several cases of a mild character followed the foregoing seven, and their nature being now most unequivocal, my friend declined visiting all midwifery cases for a time, and there was no recurrence of the disease." These cases occurred in 1833. Five of them proved fatal. Mr. Ingleby gives another series of seven cases which occurred to a practitioner in 1836, the first of which was also attributed to his having opened several erysipelatous abscesses a short time previously.

I need not refer to the case lately read before this society, in which a physician went, soon after performing an autopsy of a case of puerperal fever, to a woman in labor, who was seized with the same disease and perished. The forfeit of that error has been already paid.

At a meeting of the Medical and Chirurgical Society before referred to, Dr. Merriman related an instance occurring in his own practice, which excites a reasonable suspicion that two lives were sacrificed to a still less dangerous experiment. He was at the examination of a case of puerperal fever at two o'clock in the afternoon. *He took care not to touch the body.* At nine o'clock the same evening he attended a woman in labor; she was so nearly delivered that he had scarcely anything to do. The next morning she had severe rigors, and in forty-eight hours she was a corpse. Her infant had erysipelas and died in two days.29

In connection with the facts which have been stated it seems proper to allude to the dangerous and often fatal effects which have followed from wounds received in the post-mortem examination of patients who have died of puerperal fever. The fact that such wounds are attended with peculiar risk has been long noticed. I find that Chaussier was in the habit of cautioning his students against the danger to which they were exposed in these dissections.3 The head *pharmacien* of the Hotel Dieu, in his analysis of the fluid effused in puerperal peritonitis, says that practitioners are convinced of its deleterious qualities, and that it is very dangerous to apply it to the denuded skin.31 Sir Benjamin Brodie speaks of it as being well known that the inoculation of lymph or pus from

the peritoneum of a puerperal patient is often attended with dangerous and even fatal symptoms. Three cases in confirmation of this statement, two of them fatal, have been reported to this society within a few months.

Of about fifty cases of injuries of this kind, of various degrees of severity, which I have collected from different sources, at least twelve were instances of infection from puerperal peritonitis. Some of the others are so stated as to render it probable that they may have been of the same nature. Five other cases were of peritoneal inflammation; three in males. Three were what was called enteritis, in one instance complicated with erysipelas; but it is well known that this term has been often used to signify inflammation of the peritoneum covering the intestines. On the other hand, no cases of typhus or typhoid fever is mentioned as giving rise to dangerous consequences, with the exception of the single instance of an undertaker mentioned by Mr. Travers, who seems to have been poisoned by a fluid which exuded from the body. The other accidents were produced by dissection, or some other mode of contact with bodies of patients who had died of various affections. They also differed much in severity, the cases of puerperal origin being among the most formidable and fatal. Now a moment's reflection will show that the number of cases of serious consequences ensuing from the dissection of the bodies of those who had perished of puerperal fever is so vastly disproportioned to the relatively small number of autopsies made in this complaint as compared with typhus or pneumonia (from which last disease not one case of poisoning happened), and still more from all diseases put together, that the conclusion is irresistible that a most fearful morbid poison is often generated in the course of this disease. Whether or not it is *sui generic* confined to this disease, or produced in some others, as, for instance, erysipelas, I need not stop to inquire.

In connection with this may be taken the following statement of Dr. Rigby. "That the discharges from a patient under puerperal fever are in the highest degree contagious we have abundant evidence in the history of lying-in hospitals. The puerperal abscesses are also contagious, and may be communicated to healthy lying-in women by washing with the same sponge; this fact has been repeatedly proved in the Vienna Hospital; but they are equally communicable to women not pregnant; on more than one occasion the women engaged in washing the soiled bed-linen of the General Lying-in Hospital have been attacked with abscess in the fingers or hands, attended with rapidly spreading inflammation of the cellular tissue. "32

Now add to all this the undisputed fact that within the walls of lying-in hospitals there is often generated a miasm, palpable as the chlorine used to destroy it, tenacious so as in some cases almost to defy extirpation, deadly in some institutions as the plague; which has killed women in a private hospital of London so fast that they were buried two in one coffin to conceal its horrors; which enabled Tonnelle to record two hundred and twenty-two autopsies at the Maternite of Paris; which has led Dr. Lee to express his deliberate conviction that the loss of life occasioned by these institutions completely de-feats the object of their founders; and out of this train of cumulative evidence, the multiplied groups of cases clustering about individuals, the deadly results of autopsies,

the inoculation by fluids from the living patient, the murderous poison of hospitals does there not result a conclusion that laughs all sophistry to scorn, and renders all argument an insult?

I have had occasion to mention some instances in which there was an apparent relation between puerperal fever and erysipelas. The length to which this paper has extended does not allow me to enter into the consideration of this most important subject. I will only say that the evidence appears to me altogether satisfactory that some most fatal series of puerperal fever have been produced by an infection originating in the matter or effluvia of erysipelas. In evidence of some connection between the two diseases, I need not go back to the older authors, as Pouteau or Gordon, but will content myself with giving the following references, with their dates; from which it will be seen that the testimony has been constantly coming before the profession for the last few years:

"London Cyclopaedia of Practical Medicine," article *Puerperal Fever,* 1833.

Mr. Ceeley's Account of the Puerperal Fever at Aylesbury, "Lancet," 1835.

Dr. Ramsbotham's Lecture, "London Medical Gazette," 1835. Mr. Yates Ackerly's Letter in the same journal, 1838.

Mr. Ingleby on Epidemic Puerperal Fever, "Edinburgh Medical and Surgical Journal," 1838.

Mr. Paley's Letter, "London Medical Gazette," 1839.

Remarks at the Medical and Chirurgical Society, "Lancet," 1840. Dr. Rigby's "System of Midwifery," 1841.

"Nunneley on Erysipelas," a work which contains a large number of references on the subject, 1841.

"British and Foreign Quarterly Review," 1842.

Dr. S. Jackson, of Northumberland, as already quoted from the Summary of the College of Physicians, *1842.*

And, lastly a startling series of cases by Mr. Storrs, of Doncaster, to be found in the "American Journal of the Medical Sciences" for January, *1843.*

The relation of puerperal fever with other continued fevers would seem to be remote and rarely obvious. Hey refers to two cases of synochus occurring in the Royal Infirmary of Edinburgh, in women who had attended upon puerperal patients. Dr. Collins refers to

several instances in which puerperal fever has appeared to originate from a continued proximity to patients suffering with typhus.[3]3

Such occurrences as those just mentioned, though most important to be remembered and guarded against, hardly attract our notice in the midst of the gloomy facts by which they are surrounded. Of these facts, at the risk of fatiguing repetitions, I have summoned a sufficient number, as I believe, to convince the most incredulous that every attempt to disguise the truth which underlies them all is useless.

It is true that some of the historians of the disease, especially Hulme, Hull, and Leake, in England; Tonnelle, Duges, and Baudelocque, in France, profess not to have found puerperal fever contagious. At the most they give us mere negative facts, worthless against an extent of evidence which now overlaps the widest range of doubt, and doubles upon itself in the redundancy of superfluous demonstration. Examined in detail, this and much of the show of testimony brought up to stare the daylight of conviction out of countenance, proves to be in a great measure unmeaning and inapplicable, as might be easily shown were it necessary. Nor do I feel the necessity of enforcing the conclusion which arises spontaneously from the facts which have been enumerated, by formally citing the opinions of those grave authorities who have for the last half-century been sounding the unwelcome truth it has cost so many lives to establish.

"It is to the British practitioner," say Dr. Rigby, "that we are indebted for strongly insisting upon this important and dangerous character of puerperal fever. "34

The names of Gordon, John Clarke, Denman, Burns, Young,[35] Hamilton,[38] Haighton,[37] Good,38 Waller, Blundell, Gooch, Ramsbotham, Douglas, Lee, Ingleby, Locock,4' Abercrombie,4E Alison,43 Travers," Rigby, and Watson," many of whose writings I have al-ready referred to, may have some influence with those who prefer the weight of authorities to the simple deductions of their own reason from the facts laid before them. A few Continental writers have adopted similar conclusions. It gives me pleasure to remember that, while the doctrine has been unceremoniously discredited in one of the leading journals,[47] and made very light of by teachers in two of the principal medical schools of this country, Dr. Channing has for many years inculcated, and enforced by examples, the danger to be apprehended and the precautions to be taken in the disease under consideration.

I have no wish to express any harsh feeling with regard to the painful subject which has come before us. If there are any so far excited by the story of these dreadful events that they ask for some word of indignant remonstrance to show that science does not turn the hearts of its followers into ice or stone, let me remind them that such words have been uttered by those who speak with an authority I could not claim.[48] as a lesson rather than as a reproach that I call up the memory of these irreparable errors and wrongs. No tongue can tell the heart-breaking calamity they have caused; they have closed the eyes just opened upon a new world of love and happiness; they have bowed the strength of manhood into dust; they have cast the helplessness of infancy into the stranger's arms, or bequeathed it, with less cruelty, the death of its dying parent. There is no tone deep enough for regret, and no voice loud enough for warning. The woman

about to become a mother, or with her new-born infant upon her bosom, should be the object of trembling care and sympathy wherever she bears her tender burden or stretches her aching limbs. The very outcast of the streets has pity upon her sister in degradation when the seal of promised maternity is impressed upon her. The remorseless vengeance of the law, brought down upon its victim by a machinery as sure as destiny, is arrested in its fall at a word which reveals her transient claim for mercy. The solemn prayer of the liturgy singles out her sorrows from the multiplied trials of life, to plead for her in the hour of peril. God forbid that any member of the profession to which she trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly!

There may be some among those whom I address who are disposed to ask the question, What course are we to follow in relation to this matter? The facts are before them, and the answer must be left to their own judgment and conscience. If any should care to know my own conclusions, they are the following; and in taking the liberty to state them very freely and broadly, I would ask the inquirer to examine them as freely in the light of the evidence which has been laid before him.

A physician holding himself in readiness to attend cases of midwifery should never take any active part in the post-mortem examination of cases of puerperal fever.

If a physician is present at such autopsies, he should use thorough ablution, change every article of dress, and allow twenty-four hours or more to elapse before attending to any case of mid-wifery. It may be well to extend the same caution to cases of simple peritonitis.

Similar precautions should be taken after the autopsy or surgical treatment of cases of erysipelas, if the physician is obliged to unite such offices with his obstetrical duties, which is in the highest degree inexpedient.

On the occurrence of a single case of puerperal fever in his practice, the physician is bound to consider the next female he attends in labor, unless some weeks at least have elapsed, as in danger of being infected by him, and it is his duty to take every precaution to diminish her risk of disease and death.

If within a short period two cases of puerperal fever happen close to each other, in the practice of the same physician, the disease not existing or prevailing in the neighborhood, he would do wisely to relinquish his obstetrical practice for at least one month, and endeavor to free himself by every available means from any noxious influence he may carry about with him.

The occurrence of three or more closely connected cases, in the practice of one individual, no others existing in the neighborhood, and no other sufficient cause being alleged for the coincidence, is *prima facie* evidence that he is the vehicle of contagion.

It is the duty of the physician to take every precaution that the disease shall not be introduced by nurses or other assistants, by making proper inquiries concerning them, and giving timely warning of every suspected source of danger.

Whatever indulgence may be granted to those who have hereto-fore been the ignorant causes of so much misery, the time has come when the existence of *a private pestilence* in the sphere of a single physician should be looked upon, not as a misfortune,

but a crime; and in the knowledge of such occurrences the duties of the practitioner to his profession should give way to his paramount obligations to society.

ADDITIONAL REFERENCES AND CASES

Fifth Annual Report of the Registrar-General of England, 1843. Appendix. Letter from William Farr, Esq., Several new series of cases are given in the letter of Mr. Storrs, contained in the appendix to this report. Mr. Storrs suggests precautions similar to those I have laid down, and these precautions are strongly enforced by Mr. Farr, who is, therefore, obnoxious to the same criticisms as myself.

Hall and Dexter, in Am. Journal of Med. Sc. for January, 1844. Cases of puerperal fever seeming to originate in erysipelas.

Elkington, of Birmingham, in Provincial Med. Journal, cited in Am. Journ. Med. Sc. for April, 1844., Six cases in less than a fortnight, seeming to originate in a case of erysipelas.

West's *Reports,* in Brit. and For. Med. Review for October, 1845, and January, 1847., Affection of the arm, resembling malignant pustule, after removing the placenta of a patient who dies from puerperal fever. Reference to cases at Wurzburg, as proving contagion, and to Keiller's cases in the Monthly Journal for February, 1846, as showing connection of puerperal fever and erysipelas.

Kneeland., Contagiousness of Puerperal Fever. Am. Jour. Med. Sc., January, 1846. Also, Connection between Puerperal Fever and Epidemic Erysipelas. *Ibid.,* April, 1846.

Robert Storrs., Contagious Effects of Puerperal Fever on the Male Subject; or on Persons not Child-bearing. (From Provincial Med. and Surg. Journal.) Am. Jour. Med. Sc., January, 1846. Numerous cases. See also Dr. Reid's case in same journal for April, 1846.

Routh's paper in Proc. of Royal Med. Chir. Soc., Am. Jour. Med. Sc., April, 1849, also in B. and F. Med. Chir. Review, April, 1850.

Hill, of Leuchars.A Series of Cases Illustrating the Contagious Nature of Erysipelas and of Puerperal Fever, and their Intimate Pathological Connection. (From Monthly Journal of Med. Sc.) Am. Jour. Med. Sc., July, 1850.

Skoda on the Causes of Puerperal Fever. (Peritonitis in rabbits, from inoculation with different morbid secretions.) Am. Jour. Med. Sc., October, 1850.

Arneth., Paper read before the National Academy of Medicine. Annales d'Hygiene, Tome LXV. 2e Partie. (Means of Disinfection proposed by M. "Semmeliveis." (Semmelweiss.)

Lotions of chloride of lime and use of nail-brush before admission to lying-in wards. Alleged sudden and great decrease of mortality from puerperal fever. Cause of disease attributed to inoculations with cadaveric matters.) See also *Routh's* paper, mentioned above.

Moir. Remarks at a meeting of the Edinburgh Medico-chirurgical Society. Refers to cases of Dr. Kellie, of Leith. *Sixteen* in succession, *all fatal.* Also to several instances of individual pupils having had a succession of cases in various quarters of the town, while others, practising as extensively in the same localities, had none. Also to several special cases not mentioned elsewhere. Am. Jour. Med. Sc. for October, 1851. (From New Monthly Journal of Med. Science.)

Simpson. Observations at a Meeting of the Edinburgh Obstetrical Socity. (An "eminent gentleman," according to Dr. Meigs, whose "name is as well known in America as in (his) native land," Obstetrics, Phil., 1852, pp. 368, 375.) The student is referred to this paper for a valuable *resume* of many of the facts, and the necessary inferences, relating to this subject. Also, for another series of cases, Mr. Sidey's, five or six in rapid succession. Dr. Simpson attended the dissection of two of Dr. Sidey's cases, and freely handled the diseased parts. His next four child-bed patients were affected with puerperal fever, and it was the first time he had seen it in practice. As Dr. Simpson is *a gentleman* (Dr. Meigs, as above), and as "a gentleman's hands are clean" (Dr. Meigs' sixth letter), it follows that a gentleman with clean hands may carry the disease. Am. jour. Med. Sc., October, 1851.

Peddle., The five or six cases of Dr. Sidey, followed by the four of Dr. Simpson, did not end the series. A practitioner in Leith having examined in Dr. Simpson's house, a portion of the uterus obtained from one of the patients, had immediately afterwards three fatal cases of puerperal fever. Dr. Peddie referred to two distinct series of consecutive cases in his own practice. He had since taken precautions, and not met with any such cases. Am. Jour. Med. Sc., October, 1851.

Copland., Considers it proved that puerperal fever may be propagated by the hands and the clothes, or either, of a third person, the bed-clothes or body-clothes of a patient. Mentions a new series of cases, one of which he saw, with the practitioner who had attended them. She was *the sixth* he had had within a few days. *All died.* Dr. Copland insisted that contagion had caused these cases; advised precautionary measures, and the practitioner had no other cases for a considerable time. Considers it *criminal,* after the evidence adduced, which he could have quadrupled, and the weight of authority brought forward, for a practitioner to be the medium of transmitting contagion and death to his patients. Dr. Copland lays down rules similar to those suggested by myself, and is therefore entitled to the same epithet for so doing. Medical Dictionary, New York, 1852. Article, *Puerperal States and Diseases.*

If there is any appetite for facts so craving as to be yet unappeased, *lassata, necdum* satiata, more to be obtained. Dr. Hodge remarks that "the frequency and importance of this singular circumstance (that the disease is occasionally more prevalent with one practitioner than another) has been exceedingly overrated." More than thirty strings of cases, more than two hundred and fifty sufferers from puerperal fever, more than one hundred and thirty deaths, appear as the results of a sparing estimate of such among the facts I have gleaned as could be numerically valued. These facts constitute, we may take it for ganted, but a small fraction of those that have actually occurred. The number of them might be greater, but "t is enough, t will serve," in Mercutio's modest phrase, so far as frequency is concerned. For a just estimate of the importance of the singular circumstance, it might be proper to consult the languid survivors, the widowed husbands, and the motherless children, as well as "the unfortunate accoucheur."

NOTES

On the Management of Lying-in Women, p. 120.
Philad. Med. Journal for 1825, p. 408.
A similar anecdote is related by Sir Benjamin Brodie, of the late Dr. John Clark, *Lancet,* May 2, 1840.
An Account of Some of the Most Important Diseases Peculiar to Women, p. 4., Gooch, *op. cit.,* p. 71.
Lond. Med. Gaz., May 2, 1835.
Lect. on Midwifery, p. 395. *Lancet,* May 2, 1840.
Lond. Cyc. of Pract. Med., art., "Fever, Puerperal."
Denman's Midwifery, p. 673, third Am. ed.
"Remarks on Puerperal Fever, pp. 12 and 13.
"For May, June, and July, 1842.
"For January 21, 1843.
"Medical Examiner for December 10; 1842.
"In a letter to myself this gentleman also stated, "I do not recollect that there was any erysipelas or any other disease particularly prevalent at the time."
"First Report, p. 105. "Second Report, p. 73.
"Collins's *Treatise on Midwifery, p.* 228, etc.
"Op. cit., p. 115.
Op. cit., p. 228.
"Lancet, May 4, 1833.
ffi *Lond. Med. Gazette,* December 10, 1831.
Ibid. for January, 1832.
"London Cyc. of Pract. Med., art., "Fever, Puerperal."
London Cyc. of Pract. Med., art, "Fever Puerperal."
Ibid.
"Brit. and For. Medical Review for January, 1842, p. 112.

Edin. Med. and Surg. Journal, April, 1838.
"Lancet, May 2, 1840.
Stein, *L'Art d'Accoucher,* 1794; *Dict. des Sciences Medicales,* art., "Puerperal." *"Journal de Pharmacie,* January 1836.
System of Midwifery, p. 292.
Treatise on Midwifery, p. 228.
"British and Foreign Med. Rev. for January, 1842.
Encyc. Britannica, xiii, 467, art., "Medicine."
Outlines of Midwifery, p. 109.
Study of Medicine, ii, 195. *Oral Lectures,* etc.
Medical and Physical Journal, July, 1830.
Dublin Hospital Reports for 1822.
Library of Practical Medicine, i, 373.
Researches on Diseases of the Stomach, etc., p. 181.
Library of Practical Medicine, i, 96.
"Further Researches on Constitutional Irritation, p. 128.
"London Medical Gazette, February, 1842.
"See *British and Foreign Medical Review, vol. iii,* p. 525, and vol. iv, p. 517. Also *Ed. Med. and Surg. Journal* for July, 1824, and *American Journal of Med. Sciences* for January, 1841.
"Phil. Med. Journal, vol. xii, p. 364.
"Dr. Blundell and Dr. Rigby in the works already cited.

FATTY DEGENERATION OF THE HEART

William Stokes, M.D.

William Stokes (1804-1878) was an Irish physician, that excelled in anatomical diagnosis. He served as president of the British Medical Association and founder of the Pathological Society in Dublin. He published his findings in a medical textbook titled: *The Diseases of the Heart and Aorta.* (Dublin: Hodges & Smith) in 1854. The text was also released in Philadelphia in 1854 and Italy in 1857. His work was translated into French by Sénac, and published in Paris in 1864 and also in Germany by Joseph von Lindwurm under the title: *Handbuch der Krankheiten des Herzens und der Aorta.* Würzburg in 1855. The version of the paper presented here is from his first edition of the text in 1854 and his Cheyne-Stokes respiration is described on pages 320-327 and paroxysmal tachycardia is on page 161. (White 2009)

General Diagnosis of the Disease

If it be inquired how far we have gone, since the time of Laënnec, in establishing the diagnosis of this affection, it will appear that as yet but little has been done. Laënnec declared that he knew of no means by which the diagnosis of fatty degeneration of the heart could be made; and Dr. Ormerod, writing in 1849, observes, that "the most extreme cases detailed may show that the diagnosis on general or physical grounds is almost impossible." "We cannot," he says in another place, "predict with certainty in any case that we shall find this lesion after death; but it is difficult for any pathological observer not to be led to suspect the existence of a disease in the repetition of the same circumstances under which he has seen it occur previously."

The diagnosis of this condition is not only possible but often free from difficulty, at least where the disease is confirmed. On the other hand, minor degrees of the affection are to be deter-mined less by direct signs than by some general characters. The diagnosis turns upon three points:-

The existence of physical signs and symptoms of diminished force of the heart.

The occurrence of certain symptoms, principally referrible to the brain, which indicate either anaemia on the arterial, or congestion on the venous side, of the cerebral circulation.

Symptoms referrible to the respiratory function, which appear to arise from deficient power in the right ventricle.

It is still to be determined how far we can distinguish during life the cases of weakened and dilated hearts, such as have been already described, from those of fatty degeneration. Microscopic-al anatomy shows that in many of the former class there is more or less of the adipose deposit. And it is plain that to the practical physician there is a relation between the diseases; for similar exciting causes concur in their production, and in both the effect of the disease is traceable to the same vital condition, namely, debility of the heart.

In its higher degrees of development this affection is most frequently met with in persons who have passed the prime of life; but minor shades of it occur in young patients, especially where there is a complication with other visceral diseases, as, for example, pulmonary tubercle. On the other hand, some of the most remarkable instances are found in very old and long bedridden subjects; and it is observed that in such cases the alteration is not confined to the heart, but extends also to the voluntary muscles, and even to the skeleton, producing atrophy and fragility of the bones, with a great deposit of oily matter in the cavities and cancelli of the osseous tissue.* Though varying and apparently opposite, its exciting causes are generally reducible to those which would induce a depraved haematosis. The over-fed and luxurious, on the one hand, and the victim of want, on the other, are liable to the disease.

Although complication with various local diseases, or with a special morbid state such as gout, is not uncommon, yet judging from the good state of the general health, and the absence of lesion in the digestive, respiratory, and nervous systems after death, we must admit that the fatty heart may be, in a large number of cases, practically considered as a local affection.

It is probable that in these uncomplicated examples, the disease attains its greatest development, and exhibits the most characteristic symptoms.

The symptoms may be divided into those referrible to the nervous, respiratory, and circulating systems.

Of the nervous symptoms, the most important are the attacks of apoplexy, or pseudo-apoplexy, to which these patients are so liable. This affection differs from ordinary sanguineous apoplexy in three particulars, namely, the frequent repetition of the seizures, the rarity of consequent paralysis, and the fact that there is not only danger from an antiphlogistic treatment, but benefit, both remedial and preventive, from the use of stimulants.

In some cases the character of these attacks approaches to that of syncope; and it is difficult to say how much of the affection is produced by the want of arterial, or the stasis of venous blood. In the earlier periods of the case the attack is more of syncope, in the later it becomes apoplectic. The attacks may occur without warning, and the first seizure be fatal. This, however, is rare. In most cases there are numerous seizures at irregular intervals; and in some, sensations referrible to the epigastrium and head,

having a resemblance to the epileptic aura, give notice to the patient that he is about to be attacked. In some there is a momentary unsteadiness in walking, and in others a tendency to faint, which may be dissipated by any ordinary stimulus; while in the more decided cases the patient becomes suddenly comatose, a condition which may be preceded by loss of memory and a lethargic state. I have at present under my care a patient whose earlier attacks were syncopal; they are now apoplectic, and come on during sleep, each one being preceded by a slight convulsion. On recovery, and after all the comatose symptoms have passed away, he remains for halfan-hour unable to recognize his most intimate friends and relations, even his wife he has mistaken for his mother. This patient is 63 years of age. This latter symptom has been observed in a case of weak heart which lately occurred in Dublin; the patient frequently failing to recognize friends who had been his intimates for half a century. The duration of the attack is generally short, paralysis is rare, and when it occurs does not seem referrible to any anatomical lesion of the brain.

The question as to whether these singular attacks are dependent upon deficient arterial supply, or rather upon venous congestion, is a difficult one, but it does not involve any important point of practice. It is true, that whatever arrests the action of the heart will retard the flow of blood in the veins of the head, but it could not cause a state of hyperaemia. The opinion that the apoplectic seizures are owing to deficient arterial supply seems the most tenable. The suddenness of the attack, and, in many instances, the rapidity of the recovery, are in favour of this view. I have noticed one case in which, on the occurrence of the pre-monitory symptoms, the patient, by hanging his head so that it rested on the floor, used to save himself from an attack. A case lately occurred to me of an aneurism of the aorta, in which three successive ruptures of the sac took place, with intervals of several days. Each rush of blood was attended with the best-marked syncopal coma and convulsions. Finally, dissection does not show any extraordinary congestion of the brain; and we learn from auscultation that the action of the heart is feeble.

This view of the cause of the attacks appears to be still further corroborated by the occurrence of symptoms of a similar nature in the case of dilated mitral opening by Dr. Fleming, which has been already given. Here the ventricle was hypertrophied to a great degree, but the patient suffered from regurgitation into the left auricle.

We can, therefore, only adopt in part the plan of treatment suggested by the late Mr. Carmichael, which was to relieve the vessels of the head by venesection, while at the same time stimulants should be used to excite the action of the left ventricle.

Symptoms Referrible to the Respiratory Function.

There is no evidence that the existence of this disease, even in an aggravated form, is an exciting cause of any organic affection of the lung. On the other hand, the researches of Ormerod, Quain, and others, have demonstrated the frequent combination of fatty heart with pulmonary disease; but in such cases we may hold that the conditions of the lung and heart have little, if any mutual relation; they are rather to be considered as the secondary accidents of a general morbid state.

But there is a symptom which appears to belong to a weakened state of the heart, and which, therefore, may be looked for in many cases of the fatty degeneration. I have never seen it except in examples of that disease. The symptom in question was observed by Dr. Cheyne, although he did not connect it with the special lesion of the heart. It consists in the occurrence of a series of inspirations, increasing to a maximum, and then declining in force and length, until a state of apparent apnoea is established. In this condition the patient may remain for such a length of time as to make his attendants believe that he is dead, when a low inspiration, followed by one more decided, marks the commencement of a new ascending and then descending series of inspirations. This symptom, as occurring in its highest degree, I have only seen during a few weeks previous to the death of the patient. I do not know any more remarkable or characteristic phenomena than those presented in this condition, whether we view the long-continued cessation of breathing, yet without any suffering on the part of the patient, or the maximum point of the series of inspirations, when the head is thrown back, the shoulders raised, and every muscle of inspiration thrown into the most violent action; yet all this without rale or any sign of mechanical obstruction. The vesicular murmur becomes gradually louder, and at the height of the paroxysm is intensely puerile.

The decline in the length and force of the respirations is as regular and remarkable as their progressive increase. The inspirations become each one less deep than the preceding, until they are all but imperceptible, and then the state of apparent apnoea occurs. This is at last broken by the faintest possible inspiration; the next effort is a little stronger, until, so to speak, the paroxysm of breathing is at its height, again to subside by a descending scale.

In other cases we see the symptom of sighing to occur in a different manner: at irregular intervals the patient draws a single, deep sigh, especially when he suffers from fatigue, want of food, or of his ordinary stimulants. This is the commonest form of the affection.* In one case it was always most evident when the patient was lying down.

The phenomena of circulation are next to be considered.

We are in want of a sufficient number of observations to enable us to declare whether in the earlier periods there is any marked character of pulse as to strength, frequency, or regularity. Many of the recorded cases of the minor stages of the disease are deficient in accurate observations of the pulse; but it may be held that no special character of pulse has been established. In some the pulse has been weak, rapid, and irregular; in others it does not seem to have differed materially from that of health.* But in confirmed cases we may meet with three important characters of pulse:-

The pulse somewhat accelerated, but occasionally intermitting; its strength may be but little altered.

The extremely weak, rapid, irregular, and tingling pulse *(pulsus formicans)*.

The permanently slow pulse, the rate of which varies from 50 to 30 in the minute, or even less.

It is probable, that in the third class of cases, or those with a permanently slow, though distinct and regular pulse, the disease has either advanced to a great degree, or

has at all events affected the different portions of the heart equably; and that we may attribute the weak and irregular pulse to conditions of the heart in which only certain portions of the organ have degenerated, or where there is a great difference between the right and left sides of the organ. It is further probable that the heart may be in two very different conditions previous to the commencement of the fatty change; and that in the case with irregular pulse, a merely weakened and perhaps dilated condition has preceded the de-posit of fat globules in the muscular fibre; while in the third class the change has occurred without previous alteration in the structure or mode of action of the heart. Some of the cases observed in persons who have been long bedridden, and who have died from rupture of the left ventricle, are of this description. Addition-al observations, however, are necessary to elucidate this subject.

If we inquire whether irregularity of pulse is indicative of valvular disease in this affection, we must consider that the symptom may be met with in cases of weak, dilated hearts, without valvular disease, and therefore, that we might expect it in the fatty degeneration. On the other hand, the occurrence of cases with a perfectly regular though slow pulse is a remarkable fact. In well-marked cases, where irregularity, rapidity, and smallness of pulse exist, we ought not, even though there be no valvular murmur, to declare too strongly against the existence of valvular obstruction; bearing in mind, first, that the very weakness of the heart may prevent the appearance of murmur; and next, that valvular disease is not infrequent combination with fatty heart. In most of the cases which I have seen, this valvular affection was at the aortic orifice, and the pulse was slow and regular.

* Of this condition numerous specimens may be seen in the Museum of the Richmond Hospital.
* The sighing respiration may be observed in persons who are labouring under certain forms of gastric or hepatic derangement, and is occasionally a symptom of undeveloped gout. It disappears under appropriate treatment, and probably indicates a temporary weakness of the heart. I lately saw a case of long-continued sighing, in which it had apparently arised from depression and anxiety of mind, but had, as it were, become a habit. The patient was a lady of very nervous disposition. A feeble murmur attended the first sound of the heart. In this case there was probably no organic lesion, for the symptom had long existed, and there were no signs of progressive disease.

Sufficient attention has not as yet been directed to this character of respiration. It is, when confirmed, almost pathognomonic of a weak and, in all probability, a fatty heart; but whether it is to be taken as indicative of the predominance of the fatty change on the right side of the heart is still an open question. Laënnec has described a form of asthma with puerile respiration, and he attributes the disease and the signs to some special modification of the nervous influence. He observes, that he has never met with it except in persons affected with mucous catarrh, and holds that dyspnoea,

arising from the mere increase of the natural want of the system for respiration, can never amount to asthma without the catarrhal complication. But he further speaks of adults and old persons who have puerile respiration without catarrh, and who, though they are not, properly speaking, asthmatic, are short-breathed, and liable to dyspnoea on the slightest exercise.

It is possible that in some of these cases at least, the heart may be in an incipient stage of fatty degeneration. I have observed the symptom in a gentleman of about 70 years of age, who has many symptoms of a weak heart. The action of that organ is regular, but the impulse is extremely feeble, and the pulse compressible. The sounds, especially the first, are very indistinct; there is no bronchial rates, but well-marked puerility of respiration exists over every portion of the thorax. He principally complains of dyspnoea on exercise, or on any mental agitation; and the symptoms have only become prominent within the last eighteen months. So far as the permanent condition of the respiration is concerned, this case answers perfectly to Laënnec's description of dyspnoea with puerile respiration. See Dr. Forbes's translation of the work of Laënnec, Article, Asthma with Puerile Respiration.

* This circumstance is worthy of consideration in connection with that which I have recorded as occurring in cases of the softening of the heart in typhus, in many of which the pulse is quite a fallacious guide in determining the strength of the left ventricle.

REPORT ON THE EFFECTS OF INFANTILE SYPHILIS IN MARRING THE DEVELOPMENT OF THE TEETH

Sir Jonathan Hutchinson

Jonathan Hutchinson (1828-1913) was an English surgeon and pathologist. His friend and mentor was Sir James Paget (1814-1899). Hutchinson had a busy career and published his findings in more than a thousand scientific papers. His description of the teeth in congenital syphilis was an important contribution to the clinical recognition of the disease. The work presented here was released in the *Transactions of the Pathological Society of London*, Vol. 9, pp. 449-456, in 1858. (White 2009)

For a considerable time past, I have been in the habit of recognizing in a certain very peculiar development of the permanent teeth an indication that their possessor had in infancy suffered from hereditary syphilis. A remark to this effect, which I made at a meeting of the Pathological Society early in its past session, being received with expressions of incredulity, it occurred to me, that it might be well to make public such evidence as I possessed on the subject. With that view, the facts which are the basis of the following report were collected. My friend, Mr. Coleman, our dentist at the Metropolitan Free Hospital, entered with zeal into the subject, and readily agreed to take casts of the teeth of any patients I should send him. Most of the cases taken, were those of patients attending at the Royal Ophthalmic Hospital, on account of chronic interstitial keratitis, an affection which is, I believe, almost always a result of inherited syphilis. Their ages varied from twenty-eight years to five years. In all a clear history of syphilis was established, either by the free confession of the patient's parents, or by the account given of symptoms of undoubted character during infancy. With this statement as to the diagnosis I must here content myself, as space will not permit of a recapitulation of the facts, on which, in each case, it was founded. The number of casts taken was thirteen,* and in all instances, a stereographic portrait of the patient was also secured, which in many instances, illustrates very well the peculiar physiognomy impressed by the disease. During the six months in which we were especially engaged in this inquiry, at least double the number of cases mentioned passed under our observation, but it was not deemed needful to take casts of all. I may here remark, that cases in which young adults display indubitable marks of having suffered from infantile syphilis, and in which also a clear history is obtainable, are very infrequent in the practice of general surgery.

Had it not been for the field offered by the Ophthalmic Hospital in connection with the form of keratitis above adverted to, I should not have been able to collect in the alloted time a tenth of the cases. With these remarks as to the nature of the evidence, I will now pass to the conclusions arrived at.

That there is *a peculiar condition of the teeth, which results from the influence of hereditary syphilis, and that the most frequent features of this condition are the following:, a. Smallness. The* teeth stand apart with interspaces, and are rounded and peggy in form instead of flat. *b. Notching.* They usually exhibit in their border a broad shallow notch, or at times, two or three (serrated). Owing to their softness, these teeth rapidly wear away, and this notching is thus often obliterated, but when markedly present, it is one of the most decisive conditions. *d. Colour.* Instead of the clear, smooth, white exterior of good teeth, they present a dirty greyish surface, totally destitute of polish and rarely smooth. No amount of cleaning will materially alter this feature which owes its existence, I believe, to the great deficiency of enamel. *e. Wearing down. As* before observed their softness from deficiency of enamel renders them liable to premature wearing down. The teeth of a syphilitic patient not twenty, will often be ground down as much as those of a very old person should be, and this in cases in which there is no peculiarity as to position, such as the front teeth meeting in the bite. An unusual degree of wearing down if co-existent with other peculiarities is then a suspicious condition. f. The signs mentioned apply almost exclusively to the incisiors and canines, and in fact the grinders are usually altered in a very much less degree. Their surfaces are often more uneven than those of healthy teeth, and now and then they present tubercular projections of very peculiar character.

These conditions are totally distinct from those produced by the ravages of caries. Very often the mouth of an hereditarily-syphilitic patient will present a full set of teeth, quite free from decay, but all of them marked with features of unmistakable peculiarity. As a general rule, however, they are very liable to caries. Of course, it is only when several of the conditions enumerated exist together, that a confident opinion can be given, and then it is the regularity of the type, and the fact that it marks all the front teeth in both jaws, which offers the best means of distinguishing it from other forms of disease or irregularity.

The above remarks apply only to the permanent set. The milk-teeth of syphilitic-infants, are liable to exfoliate before being cut, and after having been cut, are often of small size, bad colour, and very liable to decay, but the notching and the peg-like form are rarely noticed. I have no doubt that the explanation of the fact that they suffer less uniformly than the permanent set, and in a somewhat different way, is to be found in the fact, that at the time of the original stomatitis, they are already well-formed, whilst the others existed only as soft pulps. It is, I am convinced, to the occurrence of syphilitic stomatitis during the first few weeks of life, and its complication with alveolar periostitis, that the mar-ring of the teeth is to be attributed. A patient may be syphilitic, but if in infancy he escape stomatitis, his teeth will not be damaged.

In demonstration that during the syphilitic stomatitis, so common in the infantile form of the disease, inflammation of the alveolar periosteum, and the tooth-pulps does actually occur, I may here mention the particulars of two cases, specimens from which were brought before the Society at a former meeting.

In the first of these, an infant aged one month, came under my care at the Metropolitan Free Hospital, in November, 1856, on account of sore mouth. I observed the edge of a central incisor, projecting from the spongy and swollen gum. On touching it with a probe, it fell out, a mere tooth crown, without any fang whatever, a few drops of thick pus followed. During the next three months, four other teeth exfoliated from the same side, all fang-less, and finally a considerable portion of the alveolar process and outer lamella of the jaw came away. The gum then became sound. The mother in this case was known to have had syphilis. I have frequently, since the teeth came away, seen the infant for relapses of syphilitic eruption.

The subject of the second case, was a female infant, aet. 7, who came under my observation at the Royal Ophthalmic Hospital, being a patient of Mr. Critchett. Her cachexia was extreme, she had suffered snuffles, and double purulent ophthalmia. The history given was, that she had been quite healthy at the time of birth, and that the symptoms had set in on the fifth day. Her mother had sores at the corner of the mouth, which were of an unmistakably syphilitic character. In this case, four teeth came away, all of them, as if the former case, mere crowns, and of a dirty colour. Suppuration attended the process of exfoliation.

These cases, it must be borne in mind, are quite distinct from examples of premature decay of teeth. The teeth had never been cut, and were thrown off by inflammation beneath them, no caries whatever existing. They are, I believe, of very infrequent occurrence; the alveolar periostitis of hereditary syphilis rarely proceeding so far as to cause either suppuration or death of the tooth crowns. They are of much interest, however, as examples of the extreme effects of the same morbid process by which, I believe, that the malformation of the permanent set, to which I have alluded, is caused.

Mr. Coleman was good enough, at my request, to preserve notes of his examination of the cases which I sent him, and as these were taken quite independently of my own, I may here suitably introduce his summary of them. It will be seen that we coincide in all important particulars.

Mr. Coleman states as follows:, “The following appears to be the most important peculiarities in the teeth of the patients I examined:

1. *“The period of the first* dentition., Although the time of cutting the first teeth varies considerably, yet from the calculations of writers upon the subject, it appears that the central incisors may be looked for about seven months after birth. In eleven of these cases where information could be obtained; two had their teeth atbirth; one when a few weeks old; two about two months after birth; two about the usual time; the remainder very late.

"The form of the teeth., They are universally small, for al-though the alveolar arches are decidedly below the average size, they are in most considerable spaces between the teeth; they are also more round in form, resembling little pegs, projecting from the gum. The central incisors of most have a deep notch in their cutting edges, giving this portion of the tooth a tuberculated appearance. In many cases the teeth are much worn from mastication, the enamel being very soft, and probably containing a smaller proportion of calcareous salts than the normal quantity; from this circumstance the notch is not so marked in some cases, though its commencement may be observed.

"In nearly every case there is a deficiency in the superior alveolar arch, at the anterior portion, so great in some patients, that the upper and lower incisors are a considerable distance from each other when the mouth is shut. The notched appearance in these being well marked, and the teeth not having been worn by mastication.

"Teeth (incisors) having a notched appearance, are not very uncommon, but they are rarely so marked as with these patients. The upper central incisors also, instead of having their internal or mesial borders slightly everted, as in every well-developed arch, have them slightly inverted towards the palate.

"Colour. This is very characteristic, being of a dirty, translucent shade, not, perhaps, unlike the size frequently seen in the oil shops, and therefore somewhat difficult to describe, but when once seen readily recognized again."

There remains two or three questions to which it may be well to attempt as explicit answers as the subject permits of before closing these observations.

1. May not the condition of the teeth described, result from other influences beside syphilis?, I have no doubt that any form of stomatitis in infancy in which the periosteum and investing membrane of the teeth became involved, could produce the same imperfections of development. Very probably many of the irregularities in the form, etc., of the teeth are due to the administration of mercurial courses in early infancy. As far, however, as my own observation has gone, I believe it is very rare for any other form of stomatitis to produce such a regular type of deviation from what is normal in size, form, and colour, as is seen in good examples of that due to syphilis. In not a few cases where the characters were well-marked, I have formed, from the teeth only, a very decided opinion as to the antecedents of the patient, and inquiry has hitherto always confirmed it. In a large majority of instances, of course such certainty is not warranted, the peculiarities not being so characteristic, and being calculated rather to excite suspicion than to remove all doubt.

In the cases of syphilitic patients in which this peculiar type of malformed teeth is observed, may it not be more reasonably attributed to the influence of mercury given to counteract the disease than to the disease itself?, Undoubtedly in a majority of the cases upon which this report is founded, the nature of the disease had been correctly diagnosed by the medical men who had had charge of the patients in infancy. It is but fair, therefore, in these to suppose that mercurial treatment had been adopted, and as regards the teeth, it is impossible to discriminate between what may have been caused

by the remedy and what by the disease. I have notes, however, of several cases in which no such diagnosis had ever been formed, and in which, as far as could be learned from the mother, no mercury had ever been given, and in these the state of the teeth was as marked as in any. No one will doubt that a severe form of inflammation of the mouth does occur in syphilitic infants who have never taken a particle of mercury, and it is well known that this condition will usually rapidly subside under the use of that drug. In neither of the cases of exfoliation of the teeth above quoted, had any mercury been given. I am disposed, there-fore, to think that this drug instead of causing, tends to diminish the dental malformation under notice, a conclusion which is strengthened by the circumstance that I have never yet seen the teeth in a condition which resembled at all closely the syphilitic type in which the history was that mercury had been given for non-specific disease in infancy.

Do the subjects of inherited syphilis always present dwarfed and ill-formed teeth?, Undoubtedly not. I fear that those who do so are only a small minority of the class. As already observed, it is, I believe, essential to this condition, that the patients shall not merely have inherited a taint, but that they shall have suffered severely in infancy from consequent inflammation of the mouth.

The infants who do suffer are, we know, but a small proportion of those whose fluids are yet in greater or less degree tainted by specific disease. In many cases I have noticed the almost entire exemption from symptoms of several infants in a family, whilst one of them had a most violent outbreak, and in two or three cases of especial interest in this respect, one twin suffered whilst its fellow escaped.

In conclusion, I may remark that the state of the teeth is often of great use in enabling us to decide whether certain other symptoms presented by adult patients are the results of hereditary or of acquired syphilis. It is of course impossible for acquired disease in any way to alter the form or size of the teeth. In two or three instances in which patients between the ages of twenty and thirty came under care, presenting the sunken nose, fissured lips and earthy complexion characteristic of syphilis, I was enabled by a glance at the teeth to determine at once that these were in all probability due to congenital, and not to acquired disease.

Mr. Jonathan Hutchinson, 18th of May, 1858.

* Twelve casts and fifteen stereographs were brought before the Society.

ON CARDIAC MURMURS

Austin Flint, M.D.

Austin Flint (1812-1886) was an American physician and pioneer in heart research. He supported the use of the binaural stethoscope in the United States. His famous descriptions on cardiac murmurs were first published in the *American Journal of Medical Sciences*, Section 44, pp. 28-54, in 1862. (White 2009)

The clinical study of cardiac murmurs, within the last few years, has led to our present knowledge of the diagnosis of valvular lesions of the heart. By means of the organic murmurs it is positively ascertained that lesions exist in cases in which, without taking cognizance of the murmurs, the existence of lesions could only be guessed at. The absence of the organic murmurs, on the other hand, enables us generally to conclude with positiveness that valvular lesions do not exist. As a rule, to which there are but few exceptions, these lesions may be excluded, if there be no murmur. These are great results; but the practical auscultator of the present day need not be told that the clinical study of cardiac murmurs has led still further into the mysteries of diagnosis. Having ascertained the different murmurs which occur in connection with valvular lesions; having traced their connection, respectively, with different portions of the heart, and to the cardiac sounds;' and, having explained satisfactorily the mechanism of their production, we are able to determine not only the existence or non-existence of valvular lesions, but their particular situation when they are present, and, to a certain extent, their character and consequences. The practiced auscultator, by listening to the murmurs alone, is able to tell whether lesions are situated at the mitral, or the aortic, or the pulmonic orifice, and he is able to say, in certain cases, that the valves which are to protect these orifices against a regurgitant current of blood, have been rendered by disease inadequate to their office. It is unnecessary to adduce proof of these statements; their correctness is sufficiently known to those who are conversant with physical exploration as applied to the diagnosis of affections of the heart. How strikingly do these facts exemplify the progress of practical medicine to those who, although still among the junior members of the profession, have practised before and since the recent developments in this department of our knowledge!

These remarks are introductory to the consideration of various practical points pertaining to the cardiac murmurs. And the first subject will relate to these murmurs in

general, viz., *the limitations of their significance.* After having considered certain points embraced in this subject, I propose to take up various points relating to the different murmurs separately.

By the limitations of the significance of the murmurs, I mean the actual amount of knowledge respecting valvular lesions to be derived from this source. It is evident, from what has been stated already, that the knowledge which they convey is of very great importance, but important as this knowledge is, it has certain limits which are not always sufficiently understood; and, as a consequence, the practitioner is liable to fall into unfortunate errors of opinion as regards the gravity of the lesions which the murmurs represent.

Prior to the clinical study of the cardiac murmurs, the existence of organic affections of the heart was recognized when, in con-junction with disturbed action of the organ, symptomatic events had taken place which belong to an advanced stage of only a certain proportion of cases. Dyspnoea, palpitation, and dropsy, were the symptoms mainly relied upon for the diagnosis. The recognized cases were then comparatively rare, and when recognized, a speedily fatal issue was expected. This fact, together with the frequency with which cardiac lesions were revealed by post-mortem examinations in cases of sudden death, rendered the diagnosis of organic disease of the heart equivalent to a summons from the grave. The prognosis, as a matter of course, was as unfavourable as possible; the doom of the patient was either to die unexpectedly at any moment, or to endure protracted sufferings until released by death. The study of the murmurs together with the application of other signs, enabled the practitioner to recognize organic affections at a period in the disease when otherwise they would not have been discovered. The recognized cases became more frequent. Persons were found to have cardiac lesions who presented few or no symptoms pointing obviously to disease of the heart. The ideas which had prevailed relative to the gravity of organic affections, however, naturally enough, continued to prevail. An organic murmur, consequently, had a fearful significance. It was considered as proof of disease which was not less surely destructive because earlier ascertained. Let it be said of a patient that he had a cardiac murmur denoting a valvular lesion, and his doom was pronounced; sudden death, which might occur at any time, or an early development of the distressing symptoms characteristic of cardiac disease, were to be expected, whatever might be his present condition.

So far from concealing from patients the fearful significance of cardiac murmurs, it was considered important for them to under-stand fully their precarious condition, in order to receive their co-operation in the measures of management which were deemed essential. These measures embraced general and local blood-letting, depletion by cathartics, sedative remedies addressed to the circulation, mercurialization, low diet, together with as much inaction of mind and. body as possible. The consequences of this management were calamitous in the extreme. In fact, these measures contributed, in no small degree, to the fulfilment of the gloomy predictions impressed upon the minds of the unfortunate patients who were found to present the auscultatory sign of valvular lesions.

So long as these notions with regard to the treatment of cardiac affections prevailed, an early diagnosis, in-stead of being desirable, was a serious disadvantage, and truly fortunate were they who kept aloof from the stethoscope of the auscultator!

Erroneous views respecting the significance of cardiac murmurs, and also respecting the indications for treatment in cases or organic disease of the heart, are still, to a greater or less extent, prevalent. I propose now to confine myself to the former, *i.e.* , the significance of the murmurs. It is obvious that with the acquirement of means of ascertaining the existence of lesions at an early period, when, without these means, the lesions could not have been discovered, clinical experience had to take a new point of departure as regards prognosis. And experience has shown that lesions giving rise to cardiac murmurs by no means invariably denote impending danger or serious evils, and that they are not unfrequently innocuous. Several clinical observers, within the last few years, have contributed facts going to show the correctness of this statement. Of these, Dr. Stokes[2] is especially prominent. Dr. Gairdner, of Edinburgh, has lately communicated a valuable paper on this subject.[3] I have been able to gather some facts having an important bearing on the subject under consideration. Of the cases which have come under my observation, exemplifying the "limitations of the significance of cardiac murmurs," I shall select a few of the most striking.

Thirteen years ago, I attended a child, aged 11 years, with a slight rheumatic attack. Directing attention to the heart, I found a very loud mitral, regurgitant murmur, heard over the left lateral surface of the chest and on the back. The heart was enlarged, the extent and degree of dulness in the praecordia being increased, and the apex beat without the nipple. The murmur was evidently not due to an endocarditis developed during the present attack of rheumatism; the lesion giving rise to it probably originated in an obscure thoracic affection which had occurred seven years be-fore. I was at that time less acquainted with the significance of cardiac murmurs than now, and I deemed it my duty to inform the mother of the patient of the existence of an organic affection of the heart, which would be likely to destroy life within a period not very remote. The patient is still living. She is now 24 years of age, and although presenting a delicate appearance, a casual observer would not suspect the existence of any disease. She is subject to palpitation, to coldness of the extremities, and experiences want of breath on active exercise but she does not consider herself an invalid, and the apprehensions caused by my communication to the mother have long since disappeared.

It is fair to presume that my opinion in this case was considered as a mistake. It was, indeed, an error of judgment as regards the prognosis, but the diagnosis was correct; the loud bellows murmur is still there, and heard over the whole chest, even through the dress, and the heart is considerably enlarged. The patient, if not destroyed by some intercurrent affection, will ultimately die of cardiac disease, yet it is now twenty years since the probable commencement of the lesions giving rise to the cardiac murmur.

Nearly twenty years ago a person was examined by a medical friend with reference to an assurance on his life. My friend, finding a loud murmur, and an abnormally strong action of the heart, brought the person to me as an interesting case for examination. I

failed to record the case, and am not therefore positive as regards the particular murmur present, but I think it was the mitral regurgitant. Since that examination, until recently, I have been in the habit of meeting this person often, although he has never been my patient. He has been, and still is engaged in active business. He is now about fifty years of age. He has survived his wife, and been again married within a few years.

I have selected these two cases as illustrating the duration of life and comfortable health for thirteen and twenty years after a loud organic murmur, together with enlargement of the heart, had been ascertained; in both cases life and comfortable health continuing at the present moment. I could cite, in addition, numerous cases of persons now living, and apparently well, who have had organic murmurs for several years. In making examinations of chests, supposed to be healthy, for purposes of study, I have repeatedly found a murmur, evidently organic, when no disease of the heart was suspected either before or after my examination. The following case is instructive, as showing the importance of taking into account the coexistence of functional disorder of the heart, dependent on anaemia, with organic disease.

In November, 1852, I visited, in consultation with Professor Rogers, of Louisville, a lady aged about 25. She had had repeated attacks of acute rheumatism. She had an infant several months old, which she was nursing, and she had become quite anaemic. She had begun to suffer from palpitation during the preceding summer, and her attention was attracted to a sound in the chest which she heard in the nighttime. This sound was also heard by a sister with whom she slept. She described, of her own accord, the sound to be like that produced by a pair of bellows. She had never heard of cardiac bellows-murmurs, and at this time there had been no examination of the chest. Prof. Rogers had been called to the patient a short time before my visit, and detected at once the existence of organic disease.

She presented an aortic direct and a mitral regurgitant murmur, both loud; the heart was moderately enlarged, and its action violent. She was conscious of this violent action, and slight exercise or mental excitement occasioned much distress from palpitation. The urgent symptoms in the case were attributed to anaemia; weaning was at once enjoined, and chalybeate remedies, etc., advised. I met the patient a year afterwards without recognizing her. She was apparently in perfect health, and presented a blooming appearance. Her friends thought we must have been mistaken in our opinion as to the existence of organic disease of the heart. The murmurs and the signs of enlargement, however, were still there. She continued to enjoy good health until the summer of 1856, when she suffered from uterine hemorrhage, and again became anaemic. The action of the heart became irregular, and she complained much of vertigo. Tonics, stimulants, nutritious diet and fresh air failed to remove the anaemic state, and at length she was seized with apoplexy and hemiplegia. She recovered from the apoplexy, but the hemiplegia continued, and death took place between two and three weeks after the apoplectic seizure.

The significance of organic murmurs is limited to the points of information already stated in the introductory remarks, viz., the existence of lesions, their localization, and

the fact of valvular insufficiency or regurgitation. Whether the lesions involve immediate danger to life, or, on the contrary, are compatible with many years of comfortable health, the murmurs do not inform us, nor do they teach us how far existing symptoms are referable to the lesions, and how far to functional disorder induced by other morbid conditions. Neither the intensity nor the quality of sound in the murmurs furnish any criteria by which the gravity of the lesions or their innocuousness can be determined. A loud murmur is even more likely to be produced in connection with comparatively unimportant lesions than with those of a grave character, because in the former, rather than in the latter case, is the action of the heart likely to be strong, and the intensity of the murmur, other things being equal, will depend on the force with which the currents of blood are moved. Whether the murmur be soft, or rough, or musical, depends not on the amount of damage which the lesions have occasioned, but on physical circumstances alike consistent with trivial and grave affections.

It may be imagined that these assertions, although true as regards murmurs produced by the direct currents of blood, do not hold good with respect to the regurgitant murmurs. The latter, it may be said, involving as they do insufficiency of the valves, will be loud in proportion to the amount of blood which regurgitates, and, therefore, the intensity of the murmur should be a criterion of the amount of valvular insufficiency. But clinical observation disproves this surmise. A minute regurgitant stream is as likely to be intensely murmuring as a large current, perhaps even more so. Here, too, the loudness of the sound will depend, in a great measure, on the power of the heart's action. To this point I shall recur when I come to consider the different murmurs separately.

The practical injunction to be enforced in connection with the limitations of the significance of the cardiac murmurs is, that we are not to judge of the magnitude of valvular lesions, of the amount of danger on the one hand, or of the absence of danger on the other hand, by the characters belonging to the murmurs. The physician who undertakes to interrogate the heart by auscultation is not to decide that the condition of his patient is alarming, simply because he finds a murmur which he satisfies himself is dependent on an organic lesion of some kind. The lesion may be at that time, and perhaps ever afterwards, innocuous; the evils arising from cardiac affections may be remote, and so far from plunging the patient into despair by the announcement of the fact that he has an incurable disease of the heart, there may be just grounds for holding out expectations of life and comfortable health for an indefinite period. Neither does it necessarily alter the case when more than one murmur is discovered; the existence of several murmurs by no means excludes the possibility of similar encouragement. We are to look to other sources of information than the murmurs in forming an opinion respecting the gravity of the affection. What are the sources of information on which our opinion is based? It does not fall within the scope of this essay to consider at length the points involved in the answer to this inquiry. I shall answer it in a few words.

The heart-sounds furnish means of determining whether the lesions are of a nature to affect materially the function of the valves. I must here pass by this useful and beautiful application of auscultation with a simple allusion to it, referring the reader

elsewhere for a full exposition of the subject. I shall, however, return to the subject presently in considering the murmurs individually. Means requiring less proficiency in physical exploration relate to enlargement of the heart. It is not a difficult problem to determine whether the heart be or be not enlarged, and it is easy to determine the degree of enlargement. Now, in general, if valvular lesions have not led to enlargement of the heart, they are not immediately dangerous, and the danger is more or less re-mote. Here is a criterion of great importance in estimating the gravity, on the one hand, or the present innocuousness on the other hand, of lesions giving rise to murmurs. So long as the heart be not enlarged, the lesions cannot have occasioned to much extent those disturbances which arise from contraction or patency of the orifices. The murmurs, in themselves, give no information respecting the amount of obstruction from contracted orifices, or of regurgitation from valvular insufficiency. Let this fact be constantly borne in mind. But obstruction and regurgitation, singly or combined, inevitably lead to enlargement of the heart; hence the latter becomes evidence of former. The degree of enlargement is, in general, a guide to the extent and duration of the disturbances occasioned by contracted and patescent orifices. As a rule, if the heart be slightly or moderately enlarged, the immediate danger from the lesions which may give rise to one or more loud murmurs is not great.

The truth is, the evils and danger arising from valvular lesions, for the most part, are not dependent directly on these lesions, but on the enlargement of the heart resulting from the lesions. We may go a step further than this and say that, ordinarily, serious consequences of valvular lesions do not follow until the heart becomes weakened either by dilatation or by degenerative changes of tissue. So long as the enlargement be due mainly to hypertrophy of the muscular walls, the patient is comparatively safe. Hypertrophy is a compensatory provision, the augmented power of the heart's action enabling the organ to carry on the circulation in spite of the disturbance due to obstruction and regurgitation. Happily, in most cases, hypertrophy is the first effect of valvular lesions, and, for a time, it keeps pace with the progress of the latter. Dilatation which weakens the heart's action, is an effect consecutive to hypertrophy, and, as a rule, it is not until the dilatation predominates that distressing and dangerous evils are manifested.

The practical bearing of these views respecting hypertrophy and dilatation, on the management of organic affections of the heart, is obvious. They are inconsistent with the employment of measures to prevent or diminish hypertrophy; on the contrary, they point to the importance of an opposite end of management, viz., to encourage hypertrophy in preference to dilatation, and to maintain the vigour of the heart's action. It does not fall within the scope of this essay to consider therapeutical applications, and I must content myself with this passing notice of an immensely important reform in the management of organic affections of the heart.

Returning to the means of determining the gravity of valvular lesions, I repeat, they become serious, in other words, the distressing and dangerous symptomatic events are to be expected, in proportion as hypertrophy merges into dilatation, or as weakness of the organ may be induced by structural degeneration or other causes. In connection,

then, with murmurs, we are to determine the condition of the heart as respects the points just mentioned, in order to estimate properly the gravity of the lesions which the murmurs represent. In leaving this subject, viz., the limited significance of the cardiac murmurs, I will give a case which is a type of a class of cases not infrequently coming under observation.

In the spring of 1860, I was consulted by a medical gentleman from a distant State, who furnished me with the following written statement of his case:

"About a year ago I went to the city of to place myself under the care of Dr., for a trifling surgical difficulty withwhich I had been annoyed for a long time. At long intervals previous to that time I had had severe pains in the left breast about the cardiac region, but at no time from any constant pain. I thought the pain was of a neuralgic character. While at I thought I would have my lungs examined, as some members of my family had been consumptive. I went to Dr. and to Dr., both of whom pronounced my lungs sound, but said thatmy heart was affected. I came home much depressed by their opinion, and suffered so much from mental anxiety that in the course of a month or two I determined to go back and consult another medical gentleman, Dr. He told me there wassome roughness about the sounds of the heart but no serious organic disease. I was much relieved by this opinion, and clung to the belief that the pains were of a neuralgic character. Previous to my going to I had all my life taken a good deal of out-doorexercise, such as riding, hunting, fishing, etc., for the purpose of warding off any tendency to consumption. I have always had a frail figure and been inclined to despondency. I have suffered a great deal of anxiety, owing to family affairs and business matters. After my return from consulting Dr.I thought it bestgo give up active exercise for fear of increasing any cardiac affection that might exist. I do not think that I have had any severe pain in my chest frequently, at any time, but only at intervals and apparently occasioned by anxiety about patients, etc.

"In December last I went into the country, 13 miles to see a patient. The weather was very cold, rainy, and windy; I returned in the night. I was suffering from toothache and smoked a cigar in order to relieve the pain. I went over to my office to write a prescription for a sick child, and on my way back I was attacked by palpitation of the heart for the first time in my life. I came into the house and lay down, when I was seized with severe rigors without chills. I had also pain in the back, and afterwards fever. Since then I have been subject, at intervals, to a jarring or knocking sensation about the heart, but no palpitation of long continuance. I cannot sleep as well on my left side as formerly, as it causes an uneasy sensation with something like palpitation and some pain. I do not take much exercise, and find that I get out of breath easily. I am very sensitive to cold. The attacks of increased action of the heart are always accompanied by rigors and irritability of the bladder. On the 19th of March, I was taken with a feeling of fatigue and indigestion, followed by severe rigors together with great heat of the head and body. The circulation was rapid and accompanied by palpitation. The attack lasted nearly an hour, and I feel the effect of it today, March 22d. I notice, when reading a newspaper

or small book, that the action of the heart causes it to vibrate. During my first attack in Dec., I had an intermittent pulse. I did not recover from that attack so as to go out for a week, and have not since been as well as before.

"Fearing that my situation was critical I have been careful of myself. I have feared to increase the affection and that I might die suddenly. But I have had fear that in taking care of the cardiac affection I shall increase a tendency to consumption. Any mental anxiety increases the action of the heart. I do not smoke nor chew tobacco, nor drink any alcoholic liquors. I have suffered much from toothache; in other respects have had generally very good health. I have never had rheumatism. I am a married man with five children. I think my cardiac affection has been getting worse since December last, and I suffer in mind dreadfully on that account, as I have a great deal to live for."

On examination of the chest, in this case, I found the apex-beat in the 5th intercostal space half an inch within a vertical line passing through the nipple. The area of superficial cardiac dulness carefully delineated on the chest, was found to be of normal extent. The left border of the heart fell within the nipple. The respiratory murmur, on a deep inspiration, was heard over the whole praecordia. The apex-beat was not abnormally strong; no other impulse was discovered, and no heaving of the praecordia.

At the first examination, the heart being but little excited, I discovered a slight murmur just to the left of the apex, heard only during the latter part of each inspiratory act. I could discover no murmur at the base. At a subsequent examination on the same day, made after dinner, the patient having drank a little wine with his dinner, the action of the heart was much greater than at the previous examination. I then discovered a well-marked systolic murmur at the apex, to the left of the apex and at the lower angle of the scapula; I also ascertained the existence of a soft systolic murmur at the base on the left side of the sternum and not on the right side. This murmur extended over the whole summit of the chest on the left side. At the summit it came evidently from the subclavian, as the pitch differed from that of the murmur over the pulmonary artery, i.e., in the 2d intercostal space on the left side.

On the next morning I made an examination while the patient was still in bed. The heart was then acting tranquilly. I discovered a feeble murmur at the apex only; this murmur was not perceived behind, and no murmur was heard at the base.

The aortic and pulmonic second sounds were normal, and so also were the mitral and tricuspid valvular elements of the first sound.

I shall quote from my record book the remarks which were appended to this case when the record was made:

"The heart is but little if at all enlarged, and the heart sounds are normal. There exist, therefore, no lesions which at present are of serious import. The cardiac trouble which has occasioned the patient so much unhappiness and anxiety, is purely functional.

"Dr. (who first examined this patient) evidently discov-ered a murmur. His examination was not very critical, and was made after the patient had just mounted

stairs at his hotel. The opinion that there was organic disease without any qualifying explanations produced a profound moral impression on the patient. The opinion of Dr. subsequently did somethingtoward revealing the apprehensions of the patient; but his coming such a long distance to consult me is evidence how much his mind was ill at ease on the subject.

"The heart is not entirely free from lesions; there is slight mitral regurgitation. The murmur at the base is perhaps inorganic, or at all events it does not denote important valvular lesions, since a comparison of the aortic and pulmonic sounds show the two to be in a normal relation to each other. The lesions in fact which exist in the case are of no immediate seriousness, and of this I assured the patient in the most positive manner.

"This case affords an illustration of the importance of discriminating between functional disorder and the effects of organic disease when there is evidence of the latter. It illustrates, also, the importance of the heart sounds and of the size of the heart in determining the gravity of lesions. The evils which may arise from the lesions (if they ever occur) are remote, and I felt war-ranted in assuring the patient that his condition involved no present danger, and that he might dismiss all thoughts of disease of the heart. I ordered him to live well and to resume his out-door sports. His apprehensions were entirely relieved by my assurances, and his expressions of gratification afforded evidence of what he had suffered mentally from the idea of an organic disease incapacitating him from the duties of life and rendering him liable to sudden death."

As I have said, this case is a type of a class of cases of not infrequent occurrence. The existence of a cardiac murmur was discovered in consequence of an examination with reference to the lungs. Prior to this time no symptoms of disorder of the heart existed; the discovery of the murmur was an unfortunate circumstance for the patient; the belief that he had serious disease of the heart became fixed in his mind, and doubtless contributed to the disorder which subsequently occurred. The functional disorder was slight in comparison with cases which are of daily occurrence; but the patient naturally attributed it to organic disease. The affection was in fact altogether functional, albeit the existence of an organic murmur; this is the practical point which the case is intended to illustrate.

I propose now to consider certain practical points pertaining to the cardiac murmur separately; I shall limit my remarks mainly to the murmurs produced by the blood-currents, in the left side of the heart, viz., the *aortic direct,* the *aortic regurgitant, the mitral systolic* and the *mitral direct.* Exclusive of the *pulmonic direct* murmur I have but little practical acquaintance with murmurs emanating from the right side of the heart.

Aortic Direct Murmur., The question whether a murmur be organic or inorganic has reference generally to a murmur produced by the current of blood from the left ventricle into the aorta. The aortic regurgitant murmur and a mitral murmur which is truly regurgitant are of necessity organic; they require lesions involving more or less insufficiency of the valves. The mitral direct murmur, as will be seen presently, is inorganic only as a rare exception to the rule. A practical point, then, in certain cases,

is to determine whether an existing aortic direct murmur be organic, i.e., dependent on lesions, or whether it be inorganic, i.e., dependent on a blood change. This point cannot always be positively settled, but when such is the case it is practically not very important that it should be settled; in other words, when a murmur exists concerning which we are at a loss to decide whether it be organic or inorganic, if it be the former, the lesion giving rise to it must be trivial, since under these circumstances the heart sounds will be found to be normal and the heart not enlarged. If in connection with an aortic direct murmur we find the aortic second sound impaired and the heart enlarged, we are warranted in considering the murmur organic. But a slight rippling of the current by roughening from an atheromatous or calcareous de-posit which occasions no obstruction, and no valvular insufficiency, may yield a murmur. How are we to distinguish this from an inorganic murmur? The absence of the anaemic state, of other cardiac murmurs, of arterial murmurs, of the venous hum, and the persistency and uniformity of the murmur are the circumstances which render it probable that it is organic; while the existence of anaemia, of other cardiac murmurs, of arterial murmurs and the venous hum, together with intermittency and variableness of the murmur, render it probable that it is inorganic.

In my work on diseases of the heart, 1859, I have stated roughness of the murmur to be one of the circumstances showing it to be organic. I then believed that an inorganic murmur was never rough. The able reviewer of my work in the *Dublin Quarterly* says, with regard to this point, "We are unable to give unqualified assent to the statement that an inorganic murmur is uniformly soft." The criticism of the reviewer is just; I was mistaken in the statement as the following case will show:

> I visited in May ,1860, a female patient who presented a loud rasping murmur which had led to the suspicion of aneurism. The patient was exceedingly anaemic; there was total loss of appetite with vomiting and diarrhoea. The anaemia could not be accounted for; it belonged in the category of cases described by Addison as cases of idiopathic anaemia. I found a rough rasping murmur at the base of the heart on the right of the sternum, and a similar murmur was heard over the subclavian and carotid. On examination after death, in this case, the heart was perfectly normal, the aortic orifice, the aorta, subclavians, and carotids were free from any morbid change, and the lungs were healthy. The murmur was evidently due to a blood change.

The discrimination of an aortic direct from a pulmonic direct murmur is a point of interest. If the normal situation of the aortic and pulmonic artery in relation to the walls of the chest be preserved, an aortic direct murmur has its maximum of intensity and may be limited to the point where the aorta is nearest the surface, viz., the second intercostal space on the right side close to the sternum. But the normal relation of the vessels to the thoracic walls is not infrequently changed when the heart becomes enlarged, or as a consequence of past or present pulmonary disease, and hence this murmur may be

loudest or limited to the base on the left side of the sternum. The situation of the murmur or of its maximum, therefore, is not always reliable in the discrimination. A pulmonic direct murmur has its maximum or is limited to the second or third intercostal spaces on the *left* side close to the sternum, the artery being at these points nearest the surface, but, as just stated, an aortic direct murmur may be found to be loudest in this situation. If the heart be not enlarged or displaced by pressure from below the diaphragm, the chest not depressed, and the lungs are free from disease, the fact that a murmur has its maximum at or is limited to the right side of the sternum, is evidence of its being aortic rather than pulmonic, and *per contra,* the fact of a murmur having its maximum at or being limited to the left side of the sternum, is evidence of its being pulmonic rather than aortic. But the propagation of the murmur into the carotid is the most important circumstance in this discrimination. An aortic direct murmur, unless it be quite weak, is generally propagated into the carotid. A pulmonic direct murmur of course cannot be. Here attention to the pitch and quality of sound is called into requisition. It is to be determined that a murmur heard over the carotid is propagated from the aorta not produced within the carotid. How is this to be determined? Very easily in most cases, by a simple comparison of the murmur as heard over the carotid and at the aortic orifice. If the murmur in the neck be a propagated murmur it will differ from that at the base of the heart chiefly as regards intensity; the pitch and quality will not be materially changed. If it be rough or soft at the base of the heart, it will be the same in the neck; if the pitch be high or low at the base of the heart, it will be the same in the neck. On the other hand, a murmur produced within the carotid, will be likely, in the great majority of cases to differ in quality and pitch from a coexisting murmur at the aortic orifice.

In accordance with what has been stated with reference to the limitations of the significance of organic murmurs in general, an aortic direct murmur, when undoubtedly organic, alone affords little or no information respecting the nature and extent of the lesions which give rise to it. A comparison of the aortic with the pulmonic second sound of the heart enables us frequently to form an opinion as regards the amount of damage which the aortic valve may have sustained. The aortic second sound, in health, as heard in the right second intercostal space near the sternum, is more intense, and has a more marked valvular quality, than the pulmonic second sound as heard in a corresponding situation on the left side. Now, it is often easy to determine whether the intensity of the aortic second sound is diminished and its valvular quality impaired; and in proportion as this sound is abnormally altered in these respects, we may infer that the aortic valve is damaged. It is hardly necessary to say that, in order for this comparison to warrant the inference just stated, pulmonary disease must be excluded. A tuberculous deposit, for example, on the left side, may, by conduction, render the pulmonic apparently more intense than the aortic sound, the latter retaining its normal intensity; the same will occur from shrinking of the upper lobe of the left lung so as to bring the pulmonary artery into contact with the thoracic walls. Under the latter circumstances the pulsation of the pulmonic artery may sometimes be distinctly felt in the second left intercostal space near the sternum. I have met with two cases during the past winter in which the

pulsation of the pulmonic artery was so strong as to suggest the idea of aneurism; in both cases the patients were affected with tuberculous disease of the left lung. Alteration of the normal relation of the aorta and pulmonic artery due to enlargement of the heart, or to any of the causes already mentioned, will of course preclude a comparison of the two sounds.

With reference to the value of a comparison of the aortic and pulmonic second sound in estimating the amount of aortic lesions, the able reviewer in the *Dublin Quartery,* to whom I have already referred, and for whose valuable criticisms I beg to avail myself of this opportunity of expressing my sincere thanks, re-marks as follows:

> "It is observed, to our great wonder, that if the aortic second sound retain its normal intensity and purity, it shows that the aortic valve is competent to fulfil its function, *a fact which warrants the exclusion of lesions affecting it sufficiently to give rise to obstruction."* He adds, "Surely Dr. Flint must have become clinically cognizant of the fact that there is not unfrequently serious contraction of the aortic orifice producing marked obstruction and hypertrophy of the left ventricle, the aortic second sound remaining intact."

This criticism is not altogether just. I state that the normal intensity and purity of the aortic second sound warrant the exclusion of lesions affecting it, i.e., the valve, sufficiently to give rise to obstruction. I do not say that contraction of the aortic orifice may not occur without involving the aortic valve, and, in such a case, the aortic second sound may remain intact. In fact, I imply this when I proceed to say, "In a large proportion of the cases of obstructive lesions of the aortic orifice, the valve is involved sufficiently to compromise, to a greater or less extent, its function and impair the intensity of the aortic second sound." This language is equivalent to admitting that there is a small proportion of cases of obstructive lesions of the aortic orifice, in which the valve is *not* involved sufficiently to compromise its function and impair the intensity of the aortic second sound. These exceptional cases are extremely rare. Surely the able reviewer will admit that, in the great majority of cases, the valve is involved so as to impair its function to a greater or less extent.

I have lately been interested in a nice point of observation connected with the murmur under consideration, viz., the concurrence of two aortic direct murmurs, one produced at the aortic orifice and another within the aorta just above the orifice. One of the murmurs may be organic and the other inorganic, or both murmurs may be organic. At the present moment I have under observation three cases of endocarditis with rheumatism, each presenting a high pitched basic murmur when the stethoscope is placed over the sternum and a little to the right of the median line, the murmur limited to a circumscribed space, and just above this point, in the right second intercostal space, is another murmur differing from the former notably in pitch, being quite low. In one of these cases there is still another murmur in the pulmonic artery. The high pitched murmur just below the second intercostal space, as I infer from the situation to which

it is limited, is a murmur produced at the aortic orifice; and the low pitched murmur just above, as I infer, also, from the situation to which it is limited, is an aortic murmur produced within the artery above the aortic orifice. I infer that there are two murmurs from the notable difference in pitch, it being by no means probable that a single sound would be so much altered within the area in which the two murmurs are heard, this area not being larger than a half dollar. That an aortic murmur is sometimes produced at the orifice and sometimes within the artery above the orifice, in different cases, is certain, but I am not aware that the production of a murmur in each situation, at the same time, in the same case, and the discrimination of the two by means of the character of the sound, have been pointed out.

Aortic Regurgitant Murmur

This murmur need never, as a matter of course, be confounded with the systolic murmurs, viz., the aortic direct, and mitral regurgitant, the latter occurring with the first, and the former with the second sound of the heart. In general, too, there is no difficulty in distinguishing the aortic regurgitant, from the mitral direct murmur. The former occurs with and follows the second sound, the latter precedes the first sound. The one is diastolic, the other is pre-systolic. This is a distinction, nice, it is true, but easily appreciable in practice, to which I shall recur under the heading of the mitral direct murmur.

The situation of the murmur is also distinctive. It is best heard at, and below the base of the heart. Usually it is best heard below the base to the left of the median line on a level with the third or fourth ribs. This is doubted by the reviewer in the *Dublin Quarter*ly, to whom I have referred, but as the statement is based on a pretty large number of recorded observations, I must consider it as correct. It is not uncommon to hear this murmur distinctly, and even loudly, over the apex; it may be diffused over the whole praecordia and even propagaged beyond this region.

An aortic murmur with the second sound of the heart, propogated below the base of the heart, necessarily implies regurgitation, in other words there must be insufficiency of the aortic valvular segments. But it is always to be borne in mind that no inference can be drawn from the intensity or character of the murmur, respecting the amount of insufficiency and consequent regurgitation. An extremely small regurgitant stream may give rise to a loud murmur, while a feeble murmur may accompany a large regurgitant current, as the rippling brook is noisy while the deep broad river flows silently. In a case recently under observation, there existed a loud aortic regurgitant murmur, and on examination after death the aortic segments were so slightly impaired that, on cursory inspection, they might have been considered as normal. Weakening or extinction of the aortic second sound of the heart are points of importance as showing frequently the extent to which the function of the aortic valve is impaired. Comparison with the pulmonic sound enables us to judge whether the aortic sound be impaired, provided the pulmonic sound be not abnormally intensified as a result of coexisting mitral lesions. It is important to recollect that when aortic and mitral lesions coexist, the intensity of

the pulmonic sound cannot be taken as a criterion for judging whether the aortic sound be, or be not weakened. This remark is equally applicable to the comparison in cases in which an aortic direct murmur is present. It is needless to say that in comparing the aortic and pulmonic sound in connection with an aortic regurgitant, as with an aortic direct murmur, pulmonary disease is to be excluded, i.e., solidification or shrinking of the left lung will, as already stated, render the pulmonic sound relatively more intense than the aortic, irrespective of, on the one hand, any actual increase of the intensity of that sound, or, on the other hand, of any weakening of the aortic sound. It is also to be stated here, as heretofore, that an alteration of the situation of the aorta and pulmonary artery as regards the thoracic walls, due to enlargement of the heart, or other causes, will preclude a comparison of the two sounds with reference either to intensification of the pulmonic, or weakening of the aortic sound.

Mitral Systolic Murmur

I use the phrase mitral *systolic,* instead of that more commonly used, viz., mitral *regurgitant* murmur, as applied to any murmur produced at the mitral orifice and accompanying the first sound of the heart. If the latter term be applied to any systolic murmur emanating from the mitral orifice, we fall into the solecism of calling a murmur regurgitant in cases in which there is no regurgitation. A mitral murmur may be produced by mere roughness of the valvular curtains when there is no insufficiency of the valve. In this case the murmur cannot be correctly said.to be regurgitant. A mitral systolic murmur, thus, may or may not be a regurgitant murmur, and, to express this important distinction, we may say that a mitral systolic murmur exists with or without regurgitation. The question at once arises, how are we to determine whether a mitral systolic murmur be regurgitant or nonregurgitant? This point claims consideration.

A mitral systolic murmur, as is well known, generally has its maximum of intensity at, and the murmuring may be limited to, the situation of the apex-beat, or to the point where the intensity of the first sound of the heart is greatest. The murmur may be diffused, in the first place, within this point over the body of the heart, and, in the second place, without the apex over the left lateral surface of the chest and on the back. I have been led to believe that when the murmur is diffused over the left lateral surface and more or less over the back, it always denotes regurgitation, and that when the murmur is not propagated much with-out the apex, although it may be more or less diffused over the body of the heart, it may be produced within the ventricle and not by a regurgitant current. In the latter case I have distinguished the murmur as an intra-ventricular murmur, and not considered it as affording any evidence of insufficiency of the mitral valve. It is this intra-ventricular, or mitral systolic non-regurgitant murmur, which generally exists in rheumatic endocarditis. The importance of the point involved is obvious, for a murmur emanating from the mitral orifice without valvular insufficiency or regurgitation, denotes lesions of little immediate consequence, and they may be innocuous, not only for the present but for the future.

The practical rule just stated, I believe, generally holds good; but there may be exceptions. The following in perhaps an exceptional instance: A case was recently under my observation in Bellevue Hospital, in which acute rheumatism was complicated with endocarditis, pericarditis, and pleurisy, with considerable effusion, affecting the left side. The patient presented, on admission, a loud pericardial friction sound diffused over the whole praecordia, and a loud mitral systolic murmur. The latter had its maximum of intensity at the apex, but was diffused over the left lateral surface of the chest and heard on the back. After the lapse of about a week the friction sound disappeared; but before the disappearance of the friction sound, the endocardial murmur had gradually diminished and disappeared. The pleuritic effusion also disappeared, and evidence was afforded in this case of pericardial adhesions by the immobility of the apex-beat when the body of the patient was placed in different positions. The disappearance of an endocardial murmur developed by rheumatic endocarditis, so far as my observation goes, is rare, although I have met with other examples. I suppose that endocarditis does not involve actual regurgitation save as a remote consequence of lesions to which the endocarditis may give rise. I may be mistaken in this supposition, but, assuming that I am not, here was an instance in which an intra-ventricular or non-regurgitant mitral systolic murmur was propagated entirely around the chest.

With reference to determining the existence of either regurgitation or obstruction, or both, resulting from mitral lesions, a comparison of the aortic and pulmonic second sound, forms a beautiful and useful application of auscultation. Obstructive and regurgitant lesions, situated at the mitral orifice, involving an obstacle to the free passage of blood through the pulmonary circuit, give rise, as is well known, to hypertrophy of the right ventricle. In this way they lead to intensification of the pulmonic second sound of the heart. This effect is due, in part, to the augmented power of the contractions of the right ventricle, and, in part, to the resistance to the passage of blood through the lungs, both continuing to increase the dilatation of the pulmonary artery by the pulmonic direct current, and the consequent recoil of the arterial coats by which the pulmonic valvular segments are expanded, and the pulmonic second sound produced. But the morbid disparity between the aortic and pulmonic second sound is due, not alone to the intensification of the latter in the manner just stated. The aortic second sound is weakened in proportion to the amount of blood which fails to pass into the aorta with the ventricular systole, in consequence of the mitral obstruction or regurgitation. It is obvious that the aortic direct current will be lessened by the amount of blood which, in consequence of valvular insufficiency, flows backward into the left auricle after the ventricle contracts, and by the amount of difficulty which exists in the free passage of blood from the auricle into the ventricle in consequence of a contracted orifice. It is also obvious that, other things being equal, the intensity of the aortic second sound will be greater or less according to the quantity of blood propelled into the aorta by the ventricular systole. Thus, it is clear how mitral obstruction and regurgitation lead to weakening of the aortic sound, as well as to intensification of the pulmonic sound, and both effects are abundantly attested by clinical observation.

The degree of weakening of the aortic and of intensification of the pulmonic sound will be proportionate to the amount of mitral regurgitation or obstruction, or both. We have then, in this application of auscultation, a means of obtaining information respecting the extent or gravity of mitral lesions. And, in a negative point of view, this application is important, viz., as a means of determining that lesions which give rise to a murmur are not serious; in other words, of determining that they do not involve much, if any, obstruction or regurgitation. As enabling us to exclude obstructive or regurgitant lesions in certain of the cases in which mitral murmurs exist, a comparison of the aortic and pulmonic sound is of great practical value. But the circumstances which may stand in the way of this application of auscultation are to be borne in mind. The two sounds cannot be compared with reference to mitral, more than with reference to aortic lesions, if there be coexisting pulmonary disease, nor whenever the normal relation of the aorta and pulmonary artery to the thoracic walls is altered by either past or present disease of the lungs, by deformity of the chest, or any other cause. It is also to be recollected that mere enlargement of the heart may disturb the normal relation of these vessels to the walls of the chest. This application, moreover, cannot be made when mitral and aortic lesions coexist. Under the latter circumstances it is, of course, difficult or impossible to determine how far an existing disparity between the aortic and pulmonic sound is due to the aortic, and how far to the mitral lesions.

Another important point pertaining to a mitral systolic murmur is, its occurrence without any appreciable lesions. A truly mitral regurgitant murmur doubtless always involves lesions of some kind, for it is hardly probable that the papillary muscles, as has been supposed, may become spasmodically affected and thus give rise to insufficiency or regurgitation as a temporary functional disorder. But it is undoubtedly true that a systolic murmur either limited to, or having its maximum of intensity near the apex, has been repeatedly observed in cases in which mitral lesions were not apparent after death. Dr. Bristowe in a paper contained in the *Brit and For. Med. Chir. Review,* for July, 1861, details six cases of this description. Dr. Barlow, in an article in Guy's *Hospital Reports,* vol. 1, 1859, states that a mitral murmur may occur (for what reason he does not state) in long-continued capillary bronchitis. I have met with some instances in which a systolic murmur, supposed to be mitral, existed, and no mitral lesions were found after death.

Case 1.[5]

In the winter of 1859-60, I saw a female patient in the Charity Hospital, New Orleans, in the service of my colleague, Prof. Brickell, affected with capillary bronchitis. After several days there was improvement as regards the pulmonary symptoms, and then, for the first time, a systolic cardiac murmur was discovered. The murmur was loudest at the epigastrium, but heard over the site of the apex, and extended to, but not above the base of the heart. The patient subsequently died. On examination after death the lungs were emphysematous; there were no valvular lesions, all the valves appearing

to be sound. The foramen ovale was closed. There were no clots. The right ventricle was distended with liquid blood. The walls of the heart were of normal thickness. The valves and orifices were not measured, nor was the water test of valvular sufficiency employed.

In recording this case I have commented on the murmur as follows: "What could have caused the loud systolic murmur? I cannot say unless it was due to distension of the right ventricle and tricuspid regurgitation."

In support of the supposition that the murmur was tricuspid, not mitral, it is to be noted that the greatest intensity was at the epigastrium. It was, however, considered to be a mitral systolic murmur during life.

Case 2.[8]

During the winter of 1860-61, a patient was under my observation in the Charity Hospital, New Orleans, for four months, affected with albuminuria and general dropsy. During all this time there was a mitral systolic murmur at the apex and over the body of the heart, and not propogated without the apex. It was regarded as a mitral systolic, nonregurgitant or intra-ventricular murmur, and as such pointed out to several private classes in auscultation. The patient died by asthenia, and was found to have fatty kidneys and cirrhosis of the liver. On examination of the heart, *post mortem,* nothing abnormal was found except some enlargement, the organ weighing 12 oz., and a little separation of the marginal extremity of two of the aortic segments. The mitral valve appeared to be perfectly normal. I expected to find some roughening of the mitral valve but no insufficiency; there was, however, no atheromatous, calcareous or other deposit, and the valve seemed to be sufficient. There was no aortic, nor pulmonic murmur in this case, a fact which excludes the supposition that the existing murmur was due to the condition of the blood.

Case 3.7

During the winter of 1860-61, a patient was under my observation in the Charity Hospital, New Orleans, for about six weeks, affected with chronic bronchitis and emphysema of lungs. He presented habitual dyspnoea which was at times excessive, persisting lividity and anasarca. The heart was evidently somewhat enlarged. There was a loud rough systolic murmur, having its maximum of intensity at the apex propagated without the apex (the record does not state how far), and over the body of the heart. On examination after death the volume of the heart was not much increased, and its weight was 13 oz. The left ventricle was not dilated and the left auricle was small. The walls of the left ventricle did not exceed half an inch in thickness, and the appearance of the muscular tissue was healthy. The mitral valve was perfectly normal. The orifice was not enlarged, and the valve must have been sufficient. No lesion at the aortic orifice. The right cavities were much dilated. They were twice as large as the left cavities. The walls

of the right ventricle were much thickened, the thickness falling but little short of that of the left ventricle. No lesion of the pulmonic orifice. The tricuspid valve was normal. The orifice was very large, admitting the extremities of all the fingers. I have appended to the record of this case the following comment. "Whence the murmur supposed to be a mitral regurgitant? I suspect it was a tricuspid regurgitant."

Dr. Bristowe, in the article already referred to, discusses several conditions which have been supposed to give rise to the murmur in cases like those which have just been given, viz., clots in the ventricular cavity, spasm of the papillary muscles, and enlargement of the auricular orifice so as to render the valve insufficient. His own opinion is that the murmur is due to a "disproportion between the size of the ventricular cavity and the length of the chordae tendineae and musculi papillares." This disproportion he attributes to dilatation of the cavity of the ventricle. He also accepts to some extent an explanation offered by Dr. Hare, viz., that the murmur may be due to a "lateral displacement of the origins of the musculi papillares in consequence of the rounded form which dilatation imparts to the heart."

These several explanations may each be applicable to certain cases, but none of them, apparently to the cases which I have given. Clots in the left ventricular cavity were not present in either of the cases; the murmur continued too long and too persistently to be due to spasm; the mitral orifice was not dilated, and the enlargement of the heart was not sufficient to occasion a notable disproportion between the length of the tendinous cords and papillary muscles, and the ventricular cavity. I am disposed to think that in each of the three cases the murmur was erroneously considered to be mitral; that it was a tricuspid regurgitant murmur. As I have already said, I have but little practical knowledge of tricuspid murmurs. I have met with two instances in which murmur was connected with well-marked tricuspid lesions as verified by examination after death. In both these cases the murmur was heard over the body of the heart, within the superficial cardiac region. I suspect that a tricuspid regurgitant murmur is not so rare as is generally supposed, and that not very infrequently it is considered to be mitral. This opinion is expressed by Dr. Gairdner in an interesting article on cardiac murmurs in the *Edinburgh Med. Monthly, Nov.,* 1861. According to this able clinic-al observer, a tricuspid systolic murmur is heard over the right ventricle where it is uncovered of lung, being but slightly audible above the third rib; and, if the heart be much enlarged, it may be heard louder towards the xiphoid cartilage. A collection of clinic-al facts respecting the frequency of tricuspid murmurs, the physical conditions giving rise to them, and the means of discriminating them from mitral murmurs, is an important desideratum.

Mitral Direct Murmur

This murmur is not recognized by many auscultators, and its existence is denied by some. It is generally confounded with a mitral systolic murmur. For many years after I had begun to devote special attention to cardiac affections, I committed this mistake, and I was sometimes puzzled to account for a supposed mitral systolic murmur

rough at its beginning and soft at its ending. In my records of some cases before I had learned to separate the mitral direct from a mitral regurgitant, I have de-scribed the latter as presenting the variation just stated, the first being that the two murmurs were present, the one rough and the other soft. It is only within the last few years that I have discriminated these two murmurs, but during this time my field of clinical observation has been so extensive that I have had abundant opportunities to make the discrimination. With regard to the frequency of the mitral direct murmur, it is by no means so rare as is generally supposed, and as I had thought some years ago. At one time during the past winter, in Bellevue Hospital, I knew of six examples of it, and several also at the Blackwell's Island Hospital. When the ausculator has learned to distinguish it, he will not be long in finding it if he be in the way of seeing a moderate number of cases of disease of the heart. From what has now been said, it is obvious that an important point pertaining to this murmur is, its discrimination from other murmurs. This point will first claim consideration.

In order to comprehend this murmur, it is essential to under-stand clearly when the mitral direct current of blood takes place.

The opportunity of observing the movements of the heart ex-posed to view in a living animal, conduces greatly to a clear understanding of this point. The mitral direct current is produced by the contraction of the auricles; now, when do the auricles contract? When the movements of the heart are observed, it is seen that the contraction of the auricles immediately precedes the contraction of the ventricles. So close is the connection between the contraction of the auricles and the contraction of the ventricles, that the former appears to merge into the latter; there is no appreciable interval between the two, but the successive movements, although distinct, appear to be continuous. Moreover, it is evident to the eye, and to the touch, that the contractions of the auricles are not so feeble as some seem to suppose. The mitral direct current of blood, therefore, occurs just before the ventricular systole; it continues up to the ventricular systole, and must, of course, instantly cease when the ventricles contract. The contraction of the ventricles causing the first sound of the heart, it follows that the mitral direct current caused by the auricular contractions must take place just before the first sound; that it must continue to the first sound, and that it cannot continue an instant after the first sound.

The mitral direct murmur is produced by the mitral direct current of blood forced by the auricular contractions through a contracted or roughened mitral orifice. Hence, the facts just stated with regard to the current, apply to the murmur. The murmur occurs just before the ventricular systole or the first sound of the heart; it continues up to the occurrence of the first sound, and instantly ceases when the first sound is heard. It is not strictly correct to call this a diastolic murmur; it does not accompany the second or diastolic sound of the heart; it continues up to the occurrence of the first sound, and instantly ceases when the first sound is heard. It is not strictly correct to call this a diastolic murmur; it does not accompany the second or diastolic sound of the heart. The aortic regurgitant is the only true diastolic murmur. The mitral direct is a pre-systolic

murmur; this name ex-presses its proper relation to the heart sounds, and it is the only murmur which does occur in that particular relation. The time of its occurrence as just explained, and as expressed by the term pre-systolic, is sufficient for its easy recognition when once it is fully comprehended. Although, when this murmur is fully cornprehended, and has been repeatedly verified, it is more readily recognized than either of the other murmurs, there is often at first considerable difficulty in determining its existence. Let me endeavour to point out the way in which it may be ascertained. I have already said that by those who overlook this murmur it is generally confounded with the mitral systolic or regurgitant murmur. This is in consequence of its close connection with the first sound, and because it is heard at and near the apex of the heart. Now it is evident that a mitral systolic murmur cannot commence before the ventricular systole. It is equally evident that the ventricular systole and the first sound of the heart are synchronous. It is, therefore, an absurdity to suppose that a mitral systolic or regurgitant murmur can be pre-systolic in the time of its occurrence. The murmur must necessarily accompany and follow the first sound of the heart, as clinical observation has established. We have, then, only to determine that a murmur is pre-systolic, and that it does not accompany the second sound of the heart (i.e., there is an appreciable interval of time between the second sound and the murmur), to recognize it as a mitral direct murmur. Generally it is sufficiently easy, after a little practice, to perceive that the murmur precedes the sound, but, if there be difficulty or doubt, there is a ready mode of rendering it apparent; this is by placing the finger on the carotid pulse. The carotid pulse is synchronous, that there is no appreciable interval of time between them. Placing, then, the finger on the carotid and listening to the murmur at the apex, the murmur is found to occur before the arterial impulse and to cease instantly when the latter is felt.

The mitral direct murmur is to be discriminated from an aortic regurgitant murmur. These two murmurs may be confounded at first, but after a little practice the discrimination is easy. The aortic regurgitant murmur accompanies and follows the second sound of the heart, the mitral direct commences after the second sound. Generally there is a distinctly appreciable interval of time between the second sound and the commencement of the murmur. The aortic regurgitant murmur may be prolonged nearly or quite through the long pause up to the first sound; but the intensity of the murmur diminishes with the prolongation, the murmur being insensibly lost before or when the first sound occurs. The mitral direct murmur, on the contrary, always continues up to the first sound, and instead of losing any of its intensity, it becomes more intense, and appears to be abruptly arrested, in its greatest intensity, when the first sound occurs. This is a striking characteristic. The difference in the situation in which two murmurs respectively are heard with their maximum of intensity, is another point in the discrimination. The aortic regurgitant murmur is generally heard at the base of the heart, and is heard loudest a little below the base near the left margin of the sternum on a level with the third intercostal space. The mitral direct murmur is heard loudest at or a little within the apex; is generally confined within a circumscribed space, not propagated much without the apex and rarely to the base of the heart.

The quality of the mitral direct murmur is, in many cases, characteristic. In my work on diseases of the heart I have said that this murmur is generally soft. My experience since that work was written has shown me that this statement is incorrect. The murmur is oftener rough than soft. The roughness is often peculiar. It is a *blubbering* sound, resembling that produced by throwing the lips or the tongue into vibration with the breath in expiration. I suppose that the murmur is caused, in these cases, by the vibration of the mitral curtains, and that the vibration of the lips or tongue by the breath represents the mechanism of the murmur as well as imitates the character of the sound. At one time I supposed this blubbering murmur denoted a particular lesion, viz., adhesion of the mitral curtains at their sides, forming that species of mitral contraction known as the *buttonhold slit;* but I have found this variety of murmur to occur without that lesion, and, in fact, as will be seen presently, when no mitral lesion whatever exists.

A mitral direct murmur may, or may not, be associated with a mitral systolic murmur. Without having analyzed the numerous examples which I have recorded during the last few years, I should say that, while the mitral systolic murmur is much more frequent in its occurrence than the mitral direct, the former, indeed, being the most common of all the murmurs, the mitral direct is observed quite as often without, as with the mitral systolic. But the two frequently coexist, and then the demonstration of the existence of the mitral direct murmur may be made more striking than when it exists alone, provided, as is usually the case, this murmur be rough and the mitral systolic murmur be soft. Listening at or near the apex in a case presenting a blubbering.

mitral direct and a soft mitral systolic murmur, the former, of course, precedes the latter, and between the two occurs the first sound of the heart, the apex-beat and the carotid pulse. The first sound, the apex beat or the carotid pulse will be found to mark the abrupt ending of the mitral direct, and the beginning of the mitral systolic murmur. The different relations of the two murmurs to the first sound are distinctly perceived in such a case if the observer be prepared to perceive them by a clear comprehension of the subject. And when once the discrimination between the two murmurs has been fairly made, it becomes sufficiently easy; in-deed, the mitral direct murmur is then more readily recognized than either of the other murmurs.

The existence of a mitral direct murmur has been theoretically denied on the ground that the auricular contractions are too weak to propel the current of blood with sufficient force to give rise to a sound. It is undoubtedly true that, other things being equal, the intensity of a murmur is proportionate to the force of the current, and clinical observation shows that sometimes a murmur is not appreciable when the heart is acting feebly, but becomes distinct when the power of the heart's action is from any cause increased. But murmurs do by no means always require for the production a powerful action of the heart; on the contrary, loud murmurs are often found when the heart is acting very feebly. For example, I have reported a case in which an aortic direct and an aortic regurgitant murmur were well marked in a patient an hour before death, the patient dying from paralysis of the heart due to distension of the left ventricle. Venous murmurs in the neck are often notably loud when, assuredly, the force of the current of blood in these veins

is vastly less than the current from the auricles to the ventricles. The feebleness of the current in this instance is shown by the slight pressure requisite to interrupt it and arrest the murmur. It requires but little force of the expiratory current of air to throw the lips into vibration so as to produce a loud sound. Moreover, one has only to see and feel the contractions of the auricle, when the heart is exposed to a living animal (the heart's action being much weakened under these circumstances) to be convinced that the power of these contractions is not so small as some seem to imagine; the blood is driven into the ventricles with considerable force. It is hardly necessary to say, however, that *a priori* reasoning with regard to the existence or non-existence of physical signs is not admissible. Their existence is a matter to be determined by direct observation. Clinical observation shows that a murmur does occur at the precise time when the mitral direct current takes place as shown by observation of the movements of the heart exposed to view in a living animal. And clinical observation shows that this murmur is not always feeble, but, on the contrary, is not infrequently notably loud.

So much for the reality of the mitral direct murmur and the means of discriminating it from other murmurs. It remains to consider another important practical point, viz., the pathological import of this murmur. As already stated, it is developed in connection with a contracted mitral orifice, and, so far as my experience goes, especially in connection with contraction caused by a adherence of the mitral curtains, forming the *buttonhole slit;* the murmur, then, being due, not to the passage of blood over a roughened surface, but to vibration of the curtains. And the sound, as thus produced, is peculiar, resembling the sound which may be produced, in an analogous manner, by causing the lips to vibrate with an expiratory puff. The murmur, however, may be produced by the flowing of the current of blood over a roughened surface, without contraction of the aperture. This is undoubtedly rare. As a rule, the force of the mitral direct current is not sufficient to develop a murmur unless there be mitral contraction. Is this murmur ever produced without any mitral lesions? One would *a priori* suppose the answer to this question to be in the negative. Clinical observation, however, shows that the question is to be answered in the affirmative. I have met with two cases in which a well-marked mitral direct murmur existed, and after death in one of the cases no mitral lesions were found; in the other case the lesion was insignificant. I will proceed to give an account of these cases, and then endeavour to explain the occurrence of the murmur.

Case 1.8

In May, 1860, I examined a patient, aged 56, who had had repeated attacks of palpitation, sense of suffocation, with expectoration of bloody mucus and a feeling of impending dissolution, but without pain, the paroxysms resembling angina, excepting the absence of pain. In the intervals between these attacks he was free from palpitation, did not suffer from want of breath on active exercise, and considered himself in good health. He had never had rheumatism. On examination of the chest, the heart was found to be enlarged, the enlargement being evidently by hypertrophy. At the apex

was a pre-systolic blubbering murmur, which I then supposed to be characteristic of the buttonhole contraction of the mitral orifice. At the base of the heart was an aortic regurgitant murmur, which was diffused over nearly the whole praecordia. There was no systolic murmur at the base or apex. Three days after this examination the patient was attacked with another paroxysm; and died in a few moments after the attack, sitting in his chair. The heart was enlarged, weighing 16'1/2oz., the walls of the left ventricle measuring four-fifths of an inch. The aorta was atheromatous, and dilated so as to render the valvular segments evidently insufficient. The mitral valve presented nothing abnormal, save a few small vegetations at the base of the curtains, as seen from the auricular aspect of the orifice.

In this case it is assumed that the mitral direct murmur, which was loud and of the blubbering character, was not due to the minute vegetations which were found after death. There was no mitral contraction. The mitral valve was unimpaired, so that the murmur could not have been due to mitral regurgitation.

Case 2.[9]

In February, 1861, I was requested to determine the murmur in a case at the Charity Hospital, New Orleans. I found an aortic direct and an aortic regurgitant murmur, both murmurs being well marked. There was also a distinct pre-systolic murmur within the apex, having the blubbering character. On examination after death, the aorta was dilated and roughened with atheroma and calcareous deposit. The aortic segments were contracted, and evidently insufficient. The mitral curtains presented no lesions; the mitral orifice was neither contracted nor dilated, and the valve was evidently sufficient. The heart was considerably enlarged, weighing 17' 1/2oz., and the walls of the left ventricle were an inch in thickness.

In the second, as in the first of the foregoing cases, it is evident that a mitral systolic murmur was not mistaken for a mitral direct murmur, for in both cases, the conditions for a mitral systolic murmur were not present. In both cases the mitral direct murmur was loud and had that character of sound which I suppose to be due to vibration of the mitral curtains. In both cases, it will be observed, an aortic regurgitant murmur existed, and aortic insufficiency was found to exist postmortem. How is the occurrence of the mitral direct murmur in these cases to be explained? I shall give an explanation which is to my mind satisfactory.

The explanation involves a point connected with the physiological action of the auricular valves. Experiments show that when the ventricles are filled with a liquid, the valvular curtains are floated away from the ventricular sides, approximating to each other and tending to closure of the auricular orifice. In fact, as first shown by Drs. Baumgarten and Hamernik, of Germany, a forcible injection of liquid into the left ventricle through the auricular opening will cause a complete closure of this opening by the coaptation of the mitral curtains, so that these authors con-tend that the natural closure of the auricular orifices is effected, not by contraction of the ventricles, but by the forcible current of

blood propelled into the ventricles by the auricles. However this may be, that the mitral curtains are floated out and brought into apposition to each other by simply distending the ventricular cavity with liquid, is a fact sufficiently established and easily verified. Now in cases of considerable aortic insufficiency, the left ventricle is rapidly filled with blood flowing back from the aorta as well as from the auricle, before the auricular contraction takes place. The distension of the ventricle is such that the mitral curtains are brought into coaptation, and when the auricular contraction takes place the mitral direct current passing between the curtains throws them into vibration and gives rise to the characteristic blubbering murmur. The physical condition is in effect analogous to contraction of the mitral orifice from an adhesion of the curtains at their sides, the latter condition, as clinical observation abundantly proves, giving rise to a mitral direct murmur of a similar character.

A mitral direct murmur, then, may exist without mitral con-traction and without any mitral lesions, provided there be aortic lesions involving considerable aortic regurgitation. This murmurby no means accompanies aortic regurgitant lesions as a rule; we meet with an aortic regurgitant murmur frequently when not accompanied by the mitral direct murmur. The circumstances which may be required to develop, functionally, the latter murmur, in addition to the amount of aortic regurgitation, remain to be ascertained. Probably enlargement of the left ventricle is one condition. The practical conclusion to be drawn from the two cases which have been given is, that a mitral direct murmur in a case presenting an aortic regurgitant murmur and cardiac enlargement, is not positive proof of the existence of mitral contraction or of any mitral lesions. The coexistence of a murmur denoting mitral regurgitation, in such a case, should be considered as rendering it probable that the mitral direct murmur is due to contraction or other lesions, and not functional.

Dr. Gairdner, in a recent article already referred to, proposes a change of name for the mitral direct murmur. He proposes to call it an auricular systolic murmur. Inasmuch as the murmur is produced by the systole of the left auricle, this name is significant. And the usual name is open to this criticism, viz.; it is not produced by the whole of the mitral direct current, but only that part of the current which is caused by the contraction or systole of the auricle. From the situation of the auricles as regards the ventricles, the former being placed above the latter, and the free communication by means of the auriculo-ventricular openings, the blood must begin to flow from the auricles into the ventricles the instant the ventricular contractions cease. During the first part of the long pause or interval of silence, i.e., the period after the second sound and before the subsequent first sound of the heart, the blood flows from the auricles into the ventricles simply in obedience to gravitation. It is not ascertained that this part of the current ever gives rise to a murmur. If it does, the murmur would follow immediately the second sound, or when an aortic regurgitant murmur occurs. I have conjectured that such a mitral direct murmur may occur, and that it is confounded with an aortic regurgitant murmur. This conjecture is based on cases in which an apparent aortic regurgitant murmur existed, and the aortic valves seemed to be nearly or quite

sufficient on examination after death. However this may be, the mitral direct current giving rise to the murmur which has been considered in this article, is not the current which immediately follows the second sound, and is due to gravitation alone, but it is the current immediately preceding the ventricular systole, and due to the systole of the auricle. Hence, as it seems to me, the name proposed by Dr. Gairdner, being more specific and accurate, is to be preferred to that in common use.

* Am. J. M. Sc. 44: 29-54, 1862.

1 The conventional distinction between the cardiac *sounds* and *murmurs* is to be borne in the mind; the former term being limited to the normal heart-sounds with their abnormal modifications, and the latter to newly-developed or adventitious sounds, which are altogether the products of disease.

2 Diseases of the Heart and Aorta.

3 Edinburgh Monthly Journal of Med. Science.

4 Doubtless they were so.

5 Private Records, vol. xi. p. 36.

6 Private Records, vol. xi. p. 243.

7 Hospital Records, vol. xv. p. 423.

8 Private Records, vol. x. p. 713.

9 Ibid., vol. xi. p. 241.

RETINITIS IN GLYCOSURIA

Henry Drury Noyes, M.D.

Henry Noyes (1832-1900) was an American ophthalmologist and as well practiced otolaryngology. Using the newly invented ophthalmoscope he first described retinopathy in diabetes. He correctly asserted the condition was linked to hypertension, an astounding insight for the time. His fine work follows here just as it was first published in the *Transactions of the American Ophthalmologic Society,* pp. 71-75, in 1865. (White 2009)

I am aware that disease of the retina has been found complicating diabetes mellitus, but cases of this kind are by no means common, and I therefore submit the following notes. In Mauthner, Lehrbuch der Ophthalmoscopie, 1868, p. 375, it is said: "Edward Jaeger found retinitis in an individual who suffered from *diabetes mellitus.* A connection between diabetes and retinitis has since that time by some (Virchow, Freytag, Nagel) been declared to be possible, and by others (Martin, Galezowski) been positively asserted. Notwithstanding pains have been taken to designate the peculiar characteristics of this retinitis, we must await further investigations to arrive at any certainty."

Jaeger's case is in his Beitrage zur Pathologic des Auges, p. 33, and Tafel, xii.

The history of the patient's general ailment is, that he was twenty-two years old, in good health until within four years, and then became feeble; had occasional febrile attacks, with swelling of the right foot; would be sometimes confined to bed, and had sometimes the phenomena of diabetes, associated with loss of appetite, dryness of the mouth, unquenchable thirst, dyspepsia, frequent vomiting after eating, and profound prostration. Lately he had cough, with free expectoration and sense of weight in the chest. Then follows a description of ocular symptoms.

But the history is strangely deficient in one vital particular there is no record of the state of the urine, either as to quantity, analysis, or in any respect whatever. All the data from which the reader may form a judgment of the patient's disease are the symptoms above related, and certainly we are not authorized to quote the case as one of diabetes mellitus in default of any knowledge of the constitution of the urine. The case may have been one of albuminuria, and the plate I have always looked upon as an illustration of the retinitis of Bright's disease. There is no account of the final result of the case.

Bouchut, Du Diagnostic des Maladies du Systeme Nerveux par 1'Ophthalmoscope, p. 442, state the occurrence of retinitis in glycosuria, and that its symptoms are identical

with those of albuminuric retinitis. Guerineau briefly makes the same allusion. Desmarres, Traite des Maladies des Yeux, t. iii., p. 522, narrates two cases of glycosuric retinitis, and finding them precisely similar to what is found in albuminuria, asks whether albuminuria may not have preceded the diabetes. Wecker does not allude to the matter. Martin, Atlas d'Ophthalmoscopie, p. 16, relates the case of a woman having glycosuria and loss of sight. Observing the papilla to be white and to reflect the light strongly, he states that the nerve was atrophied and had no traces of oedema or infiltration. He saw circular or oval hemorrhagic spots along the retinal vessels, and thought he saw little whitish spots of exudation. On this basis of induction he draws the diagnostic inference that glycosuric retinitis differs from albuminuric retinitis in respect of atrophy of the papilla, in absence of inflammation and in the oval form of the hemorrhagic spots. The exudations have a whiter tint than in albuminuria. On turning to the plates which are to show us these distinctions, we find the author's artistic powers to be even more wretched than his description and logic.

Without quoting authorities further, I give the particulars of the following case.

November, 1867. Mrs. M., aged 60, tall and spare, has for fourteen years had urinary trouble, and during three years past has been treated for it by Dr. B., who put her on rigid dietary regimen and administered opium, gr. j., ter in die. The case was clearly ascertained to be glycosuria, and under the above treatment the quantity of urine diminished and the health improved. in the summer of 1867 she had double iritis. Before this attack of inflammation she says her sight was a little dim, and after it had passed away the adhesions of the pupils would account for an additional loss of sight. From her history it is impossible to fix the time when retinitis began. Her usual condition is as follows: Both eyes, H. /20. Right, V $^{=2}/_{4}{}^{0}/_{0}$. Left, V. $=2/4\ {}^{0}/_{o}$. In left the pupil responds very little to atropia, and it is difficult through the small aperture to see the fundus; the nerve is hyperaemic, edges well defined, vessels a little turgid. Between the disk and the macula, minute glistening white points are seen in the retina, and at the macula they form a circle; they have the exact look of specks of fatty degeneration in color and arrangement and lustre. There are also a few ecchymoses, some of them near, others distant from vessels.

In right eye similar appearances are seen, but in a less marked degree; the tissue of the retina clear, and the vitreous a little hazy. The above appearances are absolutely identical with what I have often seen in cases of chronic renal disease, and I assumed such must now be the case. I tested the urine and found absolutely no albumen and abundant sugar.

I therefore determined on a rigid investigation to ascertain whether, as sometimes happens, albuminuria and glycosuria might not co-exist, the evidences of albumen being for the time in abeyance.

The patient was very intelligent and readily consented to aid my search. She kept a record of the quantity of urine passed per diem, and sent me specimens twice weekly. Not being able to detect albumen by the usual tests, my next effort was to see if there might be deficient excretion of urea, as must be the fact if there be serious kidney lesion. I employed Davy's test, which depends on the decomposition of urea by hypochloride of soda, with evolution of nitrogen gas. I also resorted to Haughton's tables for estimating the urea from specific gravity (see Roberts, p. 89). I made about twelve examinations

from November to March, and unfortunately some of the records were lost, but the facts are, that the urine varied in quantity from 80 to 96 per diem; its specific gravity 1026 to 1028; no albumen; urea, in five examinations, was 356 gr., 412 gr., 419 gr., 518 gr., 480 gr., a quantity of urea quite sufficient for a woman whose weight was about 125 lbs. and whose exercise consisted in two hours' walking, and whose diet was chiefly animal food, but only in small quantities. Before my acquaintance with the patient her urine had been frequently examined, both chemically and microscopically, without finding evidences of renal disease. In December fresh hemorrhages took place into the left retina, and the glistening spots increased in number and extent, the fundus acquiring an appearance perfectly typical of albuminuric retinitis.

In February I thought I detected slight evidence of albumen in the urine, and got Prof. Flint, jr., to examine the fluid; his note reported urine in "color paler than usual, reaction acid, sp. gr. 1028, no albumen, sugar in considerable quantity; in the deposit a considerable quantity of pavement epithelium and an abundance of spores of vegetable growth."

The urine was again tested in May, and with the same results, viz., existence of sugar, absence of albumen, sufficient quantity of urea.

A fresh hemorrhage occurred into the retina in May. Up to that time there had been a degree of improvement of sight by absorption of the apoplexies.

Patient's general health continued fair; treatment consisted in the use of iron and tonics, without local treatment, except atropia to loosen the iritic adhesions.

I may remark that there is no evidence of syphilis. My conclusions from this case are that pure glycosuria is capable of causing retinitis, and that the ophthalmoscopic appearances cannot be distinguished from those which belong to albuminuric retinitis.

I may add one more remark, viz., that when I see a typical case of nephritic retinitis, my belief in the existence of renal disease is not shaken by absence of albumen, nor by absence of casts and other usual microscopic appearances. It is well known that those symptoms are very liable to disappear in chronic cases, and many examinations may be made before they can be detected. I have known one instance in which albumen and casts were found once, and could not be again detected; the patient lived several months, and his kidneys exhibited most complete degeneration. A habitual diminution in the excretion of urea will help form a correct diagnosis, while, if characteristic retinitis have intervened, this evidence is exceedingly strong. The ophthalmoscope may then be styled a nephroscope.

But when we are constrained to admit that glycosuria and albuminuria may cause the same kind of retinitis, the question what is the element which causes this inflammation, becomes very puzzling. Some have thought that cardiac disease was the direct cause, but this has been proved repeatedly not to be true. Again we have conjectured that urea in the blood was the poison to the retina. But this is not true in glycosuria, and we are therefore not at liberty to assume that it is true in Bright's disease. Hence we are left without a valid theory to account for the peculiar retinitis which sometimes occurs in these cases of urinary trouble.

ON THE PROPER DESIGNATION OF THE PRESENT EPIDEMIC (CEREBRO-SPINAL MENINGITIS)

Alfred Stillé, M.D.

Alfred Stillé (1813-1900) was the first American physician to distinguish between typhus and typhoid fever. His following paper is a mastery of the clinico-pathologic method to discover the etiology of disease. He is responsible for the term cerebrospinal meningitis and defined the spectrum of the disease. He published these findings in his book *Epidemic Meningitis or Cerebrospinal Meningitis*, in 1867. This following paper is from the American Medical Association, Annual Report, published in 1867. (White 2009)

The different and opposing views which have been taken by Fellows of the College respecting the nature and the appropriate name of the fatal epidemic which has prevailed in this city, and in various other localities, induce me to attempt a more exact determination of both than I was able to do in the few verbal remarks which I made at a former meeting, when reporting a case of the disease which had fallen under my observation.

The scientific nomenclature of diseases is apt to reflect the dominant pathological ideas of the time, while their popular appellations are still more generally derived from the salient symptoms which characterize them. The latter are therefore more constant, in general, than the former. But, as pathological science advances, there is a slow and gradual, but still an uninterrupted, tendency to replace popular by scientific names names which express the essential constitution of diseases, and their relation, therefore, to others which partake more or less of the same nature, and require, in a greater or less degree, the same methods of treatment. When, therefore, a disease is met with which at first appears to be unlike others, it is natural and proper provisionally to distinguish it by a name representing its most striking and constant phenomenon; but as soon as its nature is determined, and its analogies established, it is equally natural and proper to bestow upon it a title which shall express its affiliation with affections already belonging to the nosological family. Thus, "black tongue" becomes "epidemic erysipelas;" "black leg" is found to be a form of "scurvy;" "summer complaint" is "cholera infantum;" "child-crowing" is "laryngismus stridulus;" and scores, or even hundreds, of similar examples might be cited, if they would not readily occur to every educated physician:

> There are diseases *totius substantiae,* which, from the rapidity with which they invade the whole economy, are concluded, upon good grounds, to originate in the blood, and which more or less confine their effects to functional disorders generated by a vitiated condition of the circulating fluid. There are others which, originating in the same manner, occasion certain special lesions of the solids. There are others, again, which commence by local disorders, and in their progress implicate the whole organism in a greater or less degree. For the last mentioned, a title expressive of their local origin is universally admitted to be appropriate. For the second, it is usual to select a name which shall denote their double characteristic of being a general disease with a specific anatomical character. But in the case of diseases without anatomical localization, a term expressive of their characteristic symptomatic expression forms the nearest approach to an accurate designation.

Typhus fever belongs to the last category. It is the peculiar product of a vitiated state of the blood, the child of famine and decay, of causes, in a word, which tend to prevent the proper renewal of the organic elements of the body, and to cause their retention within the economy as effete organic, and therefore poisonous, matters. It occasions no local lesion, but affects the totality of the organs upon whose action, according to a certain manner, life depends. The name, therefore, which it most appropriately bears, denotes its most characteristic phenomenon, the typhous quality of all its symptoms.

Typhoid fever includes other elements. In addition to a greater or less degree of those which belong to typhus, it presents symptoms of intestinal disease, and corresponding lesions. At one time, it will be remembered, these lesions were held to be the source of the local and general phenomena of the disease, and it was consequently termed entero-mesenteritis. But further observation showed that a fatal termination of an attack might occur before any ulceration of Peyer's glands had taken place, and consequently that this ulceration was a consequence of the essential morbid process of the disease, and not its effect. The theory that the symptoms, as a whole, originated in the intestinal lesion could no longer be supported; and more attention having been directed to the *quality* of the symptoms them-selves, which were evidently typhoidal and febrile, the affection acquired the name of typhoid fever. But this step was towards the opposite extreme, for the new name had no reference to the anatomical character of the disease, the alteration of the mesenteric and intestinal glands. A further modification of the nomenclature was therefore demanded. As all my hearers know very well, Dr. Wood proposed the term enteric fever, and its general adoption at home and abroad proves that it expresses better than any former denomination the peculiar double character of the disease. That it is open to criticism, I presume its distinguished author will concede; but it is very certain that it possesses in a high degree the merit of describing the affection to which it is applied its essential lesion and its prominent symptom. In this, as in all diseases which present a definite anatomical character, the lesion represents the body, or

material element of the disease, while the predominant symptom typifies its immaterial and vital manifestation. The two together constitute the most perfect image we can conceive of the disease in its totality.

These remarks will serve to illustrate the principles upon which I think the epidemic disease of the winters of 1863 and 1864 should be named. If it possesses a distinct anatomical character, let that be the ground of its title; if it does not present such a lesion, but, in its stead, a constant symptom, let that symptom confer its name upon the affection. Or if any lesion and symptom can be found in constant union, let them jointly be used to designate it.

A year ago a paper was read, by a Fellow of the College, in which it was stated that the disease was unknown in Europe; that the only account of it to be found is an imperfect description given of it by a number of physicians of New England, between 1807 and 1816; that "Dr. Gallup gave the name of spotted fever to it;" and that "this designation should be retained, inasmuch as it is drawn from one of the most characteristic symptoms of a disorder which offers no peculiar anatomical lesions." I feel very doubtful whether my excel-lent friend, the author of that paper, would now repeat the statements which he then made, evidently without having consulted the most important original histories of the New England epidemics, and when, as the disease was entirely novel to himself, his knowledge of it had not been thoroughly matured. I propose, by a reference to the published records of its history, to show, 1st, that the disease is not correctly named *spotted fever;* and 2d, that its proper title is *epidemic meningitis,* or, if it be preferred, *cerebro-spinal meningitis.* An enumeration of proofs may not present the interest of a discussion in which affirmative and negative arguments are debated, but, where the question to be decided relates to opinions which have passed into judgments, it is perhaps the shortest and most conclusive method. I shall proceed, then, first, to show by citations from authors who wrote upon the first epidemic in the United States, that they either testify directly against the application of the term "spotted fever" to this disease, or else show that spots were neither an invariable, nor, in some epidemics, even a frequent symptom.

Dr. Nathan Strong, Jr., says "these spots, which in 1806-7 marked almost every case, in 1808-9 were rarely observed." The spots, he also remarks, "gave rise to the name *petechial* or *spotted fever, which has been very generally, though very improperly, applied to the disease."*

Dr. North, referring to petechiae, remarks: "This symptom does not occur so often as the name which this disease has obtained would lead one to expect . . . . They are by no means a constant or a frequent symptom." Dr. Lyman, after describing the mulberry rash, petechiae, and vibices, adds: "There are, however, some, even among the fatal cases, without any such appearances on the skin." Dr. Woodward, describing a second occurrence of the epidemic, remarks: "An eruption on the skin so seldom appeared, that it could no longer be considered a characteristic symptom of the disease." In the report of Drs. Haskell, Spooner, and Holmes it is stated: "But neither the spots nor the eruptions are inseparably connected with this disease." Dr. Fiske says: "An eruption, which the name of this disease seems to imply, is not a constant attendant upon it." Dr. Arnell

testifies that the spots "are not always a constant attendant upon the disease." All of this testimony is contained in the valuable little volume published by Dr. North in 1811.

An earlier treatise, although first published in 1813, is the report to the Massachusetts Medical Society, by a committee consisting of physicians no less eminent than Thomas Welsh, James Jackson, and John C. Warren. They devote a section of their report to discussing "the name and character of the disease," and introduce it with the following words: "This disease has been called spotted or petechial fever. The name has been considered improper by most medical men who have had occasion to remark upon the subject." Among their conclusions from the discussion is this one: "In a very considerable proportion of cases there are not discovered either spots or eruptions. Indeed, if we except some slight appearances on the inside of the elbow-joint, and in similar places, which very probably are to be attributed to sweating, *such spots and eruptions are comparatively rare."* In their description of the symptoms of the affection, they also say: "It is not easy to determine in how large a proportion of subjects the skin is affected with spots and eruptions. Under the observations of some gentlemen they have been very rare. One remarks that in eighty cases, among which twenty were very severe, he had seen only four instances in which spots or eruptions of any kind had taken place; and he adds that these had not been the worst cases under his care."

A scarcely less meritorious paper is entitled "Remarks on the Spotted Fever, as it prevailed in Hartford, Conn., in the Year 1809. By Dr. Henry Fish." It is equally emphatic regarding the inconstancy of the symptom. "Petechiae, or livid spots, from which spotted fever has derived its name, *did not occur in one case of this epidemic* before death; after it, they were noticed in several."

A writer in the *New England Journal,* for 1814, has the following remarks: "Considerable misapprehension has arisen from the very name of spotted fever;' for though the word *spotted* is a fair equivalent to the word *petechial, . . .* yet spots of a nature to *attract notice* are often wanting in *five cases out of six,* and sometimes in a larger proportion. Hence well-informed practitioners of all descriptions are dissatisfied with the name." Dr. Gallup, so far from having given this name to the disease, and writing after it had become familiar, says distinctly: "The eruption, which has given a name to this disease, is not a constant attendant . . . . The proportion of cases which had distinct eruptions may be estimated at one-sixth." Unless upon the etymological principle *in lucus a non lucendo,* it is difficult to comprehend the propriety of calling a disease *spotted fever* which, in a large proportion of cases, presents no spots at all, and which, further-more, is less a fever than an inflammation, as I shall endeavour presently to demonstrate. The citations which have been made suffice to prove that they who had the best opportunities for witnessing the earlier ravages of the disease in this country, and of becoming acquainted with all its phases, pronounced "spotted fever" a misnomer. It is not less so now than it was half a century ago.

Many years passed away and no return of the epidemic was record-ed. Meanwhile, thanks to the publications of Dr. Gerhard and other physicians, the two great idiopathic fevers were distinguished from one another, and established as the only two continued

fevers of a grave type occurring in northern latitudes. Meanwhile, too, pathological anatomy became more generally cultivated, and the spinal marrow, whose functions had been previously ignored or unknown, was admitted to be an organ, and not a subordinate one either, but an organ to which the brain itself is, after all, a mere appendage. From 1842 *to 1850* the disease we are considering prevailed in the southwestern States. It was there carefully studied by not a few physicians, and although, "in numerous instances," "petechiae and ecchymoses" were observed, and also "an eruption resembling nettle rash," and "an efflorescence not unlike that of scarlatina," no one appears to have called it "spotted fever."

Finally, the disease having again made its appearance for a short time in Massachusetts and New York in *1850-51,* the present epidemic took its rise in the western and central parts of the last named State in *1857,* and has since travelled chiefly in a southwardly direction as far, at least, as North Carolina. In this extensive and disastrous progress it has been carefully watched by a large number of physicians, and, so far as I can learn, none have described it as "spotted fever" in any published writing, except Dr. Gerhard, with some other physicians of this city, and Surgeon Wales, U. S. N. , stationed at Newport, R. I.

From these notices, although very brief, it must, I think, be concluded that spots of no description, petechial, rubeolous, roseolous, or other can be regarded as characteristic of the disease, and that consequently a name derived from so inconstant a symptom must be regarded as inappropriate. As for the particular name which it is sought to attach to this affection, it is already appropriated by another in which the spots really are a characteristic symptom. I refer to typhus fever, a spotted fever in the true and literal sense of the term, and which more than a century ago received that name in England from several of its historians. In Germany, also, it was known by a title which means exactly *spotted fever* (Flecken Fieber).

Petechial and ecchymotic spots do not belong essentially and exclusively to any disease, but to a particular condition of the blood, and perhaps of the solids also, which may be present in almost every affection involving the whole system, as in typhoid fever, the eruptive fevers, yellow fever, scurvy, purpura, and many others. The disease which we are considering would be singular indeed if it ran so remarkable a course and presented such peculiar symptoms as it usually does, without possessing some element better fitted to giving it a name than an eruption which does not exist in half the cases. I proceed, therefore, to inquire what symptoms and what lesions characterize it so frequently as to entitle them to confer a name upon it, and I again resort to the historical documents which have been already cited, requesting particular attention to the fact that at the very time when the disease continued to be called "spotted fever" for convenience sake, its scientific position as a cerebro-spinal meningitis was perfectly well understood.

Dr. North mentions "among the more unusual symptoms of the fever," a "dilatation, and in some a contraction of the pupils of the eyes; blindness in some, in others double or treble vision; a drawing back of the head, with *a kind of clonic spasm of the muscles of the neck."* President Fitch speaks of "pain and rigidity of the muscles of the neck often, and *the head is in many instances inclined back-wards."* Dr. Woodward, also, describes

"the head drawn back with spasm." In the Report to the Massachusetts Medical Society before alluded to, the following symptoms are particularly noticed: "Numbness or total insensibility and paralysis in a larger or smaller portion of the body, which occur often in the first stage of the disease, and continue through its whole course, and even after other symptoms have subsided; . . . and spasms which frequently occur, and shift suddenly in the same manner as the pain does from part to part; sometimes resembling hysteric spasms, *sometimes occasioning the head to be drawn back as in opisthotonos."* Dr. Fish, of Hartford, describes anaesthesia and paralysis of various parts, blindness, loss of the sense of taste, spasmodic deglutition and paralysis of the pharynx. Dr. Gallup says, "Convulsions or spasms sometimes usher in the disease. That form of tetanus called opisthotonos comes on sometimes towards the close of severe cases; it denotes an alarming case, but is not a fatal symptom."

Finally, Dr. Miner, describing a case which occurred in 1816, uses the following language: "He was as stupid as a block, unconscious of any impression on either of the senses, and so convulsed that it required three or four men to hold him on his bed. His eyes were open, and rolled back, so as to hide the coloured part, *and his teeth were as firmly clenched as in locked jaw."* It is added: "His face, arms, legs, and body were literally covered with spots," &c. In his remarks upon this case, Dr. Miner says: "*Spotted fever appears to have its seat and throne in the brain,* to belong nosologically to the passive Phlegmasiae."

It is evident, therefore, that long before the affection ceased to be called "spotted fever," those of its symptoms which denote serious disease of the central organs of the nervous system had been observed, described, and properly appreciated. It is of course unnecessary to cite in detail analogous illustrations after it had been recognized as a meningitis. Dr. Drake has furnished material for this in the chapter of his work on *The Principal Diseases of the Interior Valley of North America,* which treats of "epidemic cerebro-spinal meningitis" as it prevailed in that region from 1842 to 1850.1 All the reporters of the existing epidemic have described the same characteristic nervous and spasmodic phenomena (paralysis and opisthotonos), as occurring more or less frequently, and in a greater or less degree, with the single exception of my friend who first presented an account of the disease to this college. Even Surg. Wales, while reporting the New-port epidemic as "spotted fever," does not fail to point out the special implication of the nervous centres, by saying, "The limbs seem paralyzed and are numb, and in some cases even insensible; there is deafness, dimness of sight, or even complete loss of vision. A few have convulsions and opisthotonos." There is, then, no doubt that among the symptoms of the present epidemic, those which characterize meningitis, especially of the base of the brain and of the spinal marrow, were prominent.

Finally, let us inquire what lesions of the nervous centres are found after death from this disease, and in what relation they stand to the symptoms which have been described. The earliest record upon the subject is that of Danielson and Mann in 1806, who, in two out of five dissections, found adhesions of the cerebral membranes, or "a fluid resembling pus, both over the cerebrum and the cerebellum." In these cases the encephalic veins were

"turgid with blood," as they also were in the three other cases which were regarded as not presenting evidences of inflammation. But the Report of Drs. Welsh, Jackson, and Warren leaves little to be desired so far as the lesions of the brain are concerned. They describe the copious discharge of the blood from the turgid veins of the dura mater when this membrane is incised, and the equally profuse flow of reddish serum from the cavity of the arachnoid. And they, moreover, make a very important distinction between the appearances in two classes of cases; in those, namely, which are fatal within the space of twelve hours from the invasion, and those which perish at a later period; in the former there is only excessive congestion of the large bloodvessels, but in the latter there are other lesions which, they say, "are more conspicuous in proportion to the duration of the disease." "The tunica arachnoides," they proceed to observe, "and the pia mater are remarkably altered in appearance by the effusion of an opaque substance between them, which may be called coagulated lymph, or semi-purulent lymph. This substance is frequently of the yellowish colour of pus, with a consistence between the tenacity of lymph and the fluidity of pus. At other times we see it possessed of the aspect of well characterized lymph . . . . The membranes at the basis present the same appearances as at the vertex of the brain." In another place they say that in severe cases of the disease there is *always* inflammation within the cranium. This extract is sufficient, I presume, to prove beyond doubt or cavil that the "spotted fever" of 1809 was a meningitis. Had the spinal marrow at that time arrived at the dignity of being considered an organ, it would doubtless have been examined. As it was, the condition of the nervous centre remained unknown until the recurrence of the epidemic between 1840 and 1850. The pathological anatomy of the disease was at that time studied very carefully by Dr. Ames, of Montgomery, Ala., and so far as appears, by him alone. It would occupy too much time to quote his very interesting description of the lesions which he found; suffice it to say that, as regards the brain, they were the same precisely as had been observed in Massachusetts thirty years before. To this, however, it is added: "So far as the spinal cord was examined, the lesions, generally speaking, were the same as those met with in the brain in the same cases. The intense vascularity of the pia mater was always present, but the lympho-purulent deposit and the injection of the cord proper were less common than in the brain. The spine was opened in its whole length in one case only." In this case, however, the dura mater is stated to have been thickened, its arachnoid lining divested of its polish; the cervical portions of the cord softened, especially in the white substance, while the converse condition prevailed in the lumbar portion, where more of the gray substance was altered. "A deposit of lympho-purulent matter was found chiefly about the roots of the anterior spinal nerves."

If we come now to the existing epidemic, the testimony is invariably the same wherever dissections have been made. Thus in 1858, at Churchill, N. Y., the post-mortem appearances were observed by Dr. Craig in no less than six cases which proved fatal in less than forty-eight hours from the commencement of the attack: "In all of them, on removing the calvarium, there was observed a turgid condition of the venous system. On removing the coverings of the brain, lymph of a yellowish and greenish hue was detected in the upper sulci of that organ; and in all there were increased quantities of

lymph with sero-purulent effusion at the base of the brain and extending down the whole length of the spinal cord. The choroid plexus was also very much engorged, and more or less serous effusion in the ventricles. We also found softening of the base of the brain and upper portions of the spinal cord."

The most complete history of the anatomical characters of the existing epidemic is contained in the Hospital Notes and Memoranda of Dr. J. Baxter Upham, Surgeon in charge of Stanley General Hospital at Newbern, N. C. He dwells, as did the original reporters of the New England epidemic, upon the different grades of the alteration according to the duration of the attack. When death took place within two or three days there were opalescence of the pia mater, increased vascularity of the membranes of the brain and spinal cord, a large effusion of serum mixed with flocculi of lymph, and "an exudation of thick, yellowish, apparently semi-organized lymph on the base of the brain and the medulla oblongata." When the attack had been of one or more weeks' duration, "the deposits on the brain were usually more marked, predominating at its base, around the pons Varolii and in the sulci of the cerebrum and cerebellum, covering the surface of the oblongata, and extending down to the spinal cord, sheathing it, in some cases, throughout its entire length." It is unnecessary to quote more of Dr. Upham's accurate and interesting description. It is enough that what has been read corroborates all the previous histories of the anatomical lesions of the disease, and tallies in every point with the original account of them furnished by the Committee of the Massachusetts Medical Society.

I conclude, therefore, that the description of the disease given by the physicians of New England between 1807 and 1816 was not an imperfect one; that the name of *spotted fever* was not conferred upon it by Dr. Gallup; that this designation should not be retained, inasmuch as spots are not the most characteristic symptom of the affection; and, finally, that it does offer a peculiar anatomical lesion which entitles it to be designated as *meningitis* with the prefix *epidemic or typhoid,* as it has been called in Europe by the best authorities ever since its pathological anatomy was investigated and its type under-stood.

It is proper, also to direct attention to the history of an epidemic of cerebro-spinal meningitis which occurred in 1849 in the towns of Milbury and Sutton, Mass., and which was described as such by Dr. Joseph Sargent, of Worcester. After relating a number of cases, all of which presented marked cerebro-spinal symptoms, and a number of them a petechial eruption, and after comparing the epidemic he had witnessed with that of 1810 to 1814, Dr. Sargent remarks: "The *spots* play but a very subordinate part in all the histories of the epidemic of thirty years ago, that I have seen, and were by no means constant. They gave the name to the epidemic *only because its lesion* was *not* known, *and the* name *was picturesque.* The name also made, perhaps, a part of its terror, and designated a kind of personification. So natural is the superstition which takes fright at severe disease which is unknown;' and which also loses half its horror of the same disease when the knife of the anatomist has fixed its locality, even though this does not diminsh its danger a tacit recognition of confidence in science and medical skill." *(Am. Jour. of Med. Sci.,* July, *1849,* p. *40.)*

ON THE ANTISEPTIC PRINCIPLE OF THE PRACTICE OF SURGERY

Joseph Lister, 1st Baron Lister, O.M., F.R.S.

Joseph Lister (1827-1912) was an English surgeon. His contribution to medicine can only be described as enormous. This revolutionary work is a final report in a series of papers he authored on antisepsis. It is presented here it's original form by the BMJ Publishing Group Permissions: Joseph Lister, 1867, British Medical Journal, Volume 2. pp. 246-281, with introductory notes from Vol. XXXVIII, Part 6. The Harvard Classics. New York: P.F. Collier & Son, 1909 14. (White 2009)

Joseph Lister was born at Upton, Essex, England, in 1827, and received his general education at the University of London. After graduation he studied medicine in London and Edinburgh, and became lecturer in surgery at the University in the latter city. Later he was professor of surgery at Glasgow, at Edinburgh, and at King's College Hospital, London, and surgeon to Queen Victoria. He was made a baronet in 1883; retired from teaching in 1893; and was raised to the peerage in 1897, with the title of Baron Lister. He died in 1912.

Even before the work of Pasteur on fermentation and putrefaction, Lister had been convinced of the importance of scrupulous cleanliness and the usefulness of deodorants in the operating room; and when, through Pasteur's researches, he realized that the formation of pus was due to bacteria, he proceeded to develop his antiseptic surgical methods. The immediate success of the new treatment led to its general adoption, with results of such beneficence as to make it rank as one of the great discoveries of the age.

In the course of an extended investigation into the nature of inflammation, and the healthy and morbid conditions of the blood in relation to it, I arrived several years ago at the conclusion that the essential cause of suppuration in wounds is decomposition, brought about by the influence of the atmosphere upon blood or serum retained within them, and, in the case of contused wounds, upon portions of tissue destroyed by the violence of the injury.

To prevent the occurrence of suppuration with all its attendant risks was an object manifestly desirable, but till lately apparently unattainable, since it seemed hopeless to

attempt to exclude the oxygen which was universally regarded as the agent by which putrefaction was effected. But when it had been shown by the re-searches of Pasteur that the septic properties of the atmosphere depended not on the oxygen, or any gaseous constituent, but on minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided without excluding the air, by applying as a dressing some material capable of destroying the life of the floating particles. Upon this principle I have based a practice of which I will now attempt to give a short account.

The material which I have employed is carbolic or phenic acid, a volatile organic compound, which appears to exercise a peculiarly destructive influence upon low forms of life, and hence is the most powerful antiseptic with which we are at present acquainted.

The first class of cases to which I applied it was that of compound fractures, in which the effects of decomposition in the injured part were especially striking and pernicious. The results have been such as to establish conclusively the great principle that all local inflammatory mischief and general febrile disturbances which follow severe injuries are due to the irritating and poisonous influence of decomposing blood or sloughs. For these evils are entirely avoided by the antiseptic treatment, so that limbs which would otherwise be unhesitatingly condemned to amputation may be retained, with confidence of the best results.

In conducting the treatment, the first object must be the destruction of any septic germs which may have been introduced into the wounds, either at the moment of the accident or during the time which has since elapsed. This is done by introducing the acid of full strength into all accessible recesses of the wound by means of a piece of rag held in dressing forceps and dipped into the liquid.' This I did not venture to do in the earlier cases; but experience has shown that the compound which carbolic acid forms with the blood, and also any portions of tissue killed by its caustic action, including even parts of the bone, are disposed of by absorption and organisation, provided they are afterwards kept from decomposing. We are thus enabled to employ the antiseptic treatment efficiently at a period after the occurrence of the injury at which it would otherwise probably fail. Thus I have now under my care, in Glasgow Infirmary, a boy who was admitted with compound fracture of the leg as late as eight and one-half hours after the accident, in whom, nevertheless, all local and constitutional disturbance was avoided by means of carbolic acid, and the bones were soundly united five weeks after his admission.

The next object to be kept in view is to guard effectually against the spreading of decomposition into the wound along the stream of blood and serum which oozes out during the first few days after the accident, when the acid originally applied has been washed out or dissipated by absorption and evaporation. This part of the treatment has been greatly improved during the past few weeks. The method which I have hitherto published (see Lancet for Mar. 16th, 23rd, 30th, and April 27th of the present year) consisted in the application of a piece of lint dipped in the acid, overlapping the sound skin to some extent and covered with a tin cap, which was daily raised in order to touch

the surface of the lint with the antiseptic. This method certainly succeeded well with wounds of moderate size; and indeed I may say that in all the many cases of this kind which have been so treated by myself or my house-surgeons, not a single failure has occurred. When, however, the wound is very large, the flow of blood and serum is so profuse, especially during the first twenty-four hours, that the antiseptic application cannot prevent the spread of decomposition into the interior unless it overlaps the sound skin for a very considerable distance, and this was inadmissible by the method described above, on account of the extensive sloughing of the surface of the cutis which it would involve. This difficulty has, however, been overcome by employing a paste composed of common whiting (carbonate of lime), mixed with a solution of one part of carbolic acid in four parts of boiled linseed oil so as to form a firm putty. This application contains the acid in too dilute a form to excoriate the skin, which it may be made to cover to any extent that may be thought desirable, while its substance serves as a reservoir of the antiseptic material. So long as any discharge continues, the paste should be changed daily, and in order to prevent the chance of mischief occur-ring during the process, a piece of rag dipped in the solution of carbolic acid in oil is put on next the skin, and maintained there permanently, care being taken to avoid raising it along with the putty. This rag is always kept in an antiseptic condition from contact with the paste above it, and destroys any germs which may fall upon it during the short time that should alone be allowed to pass in the changing of the dressing. The putty should be in a layer about a quarter of an inch thick, and may be advantageously applied rolled out between two pieces of thin calico, which maintain it in the form of a continuous sheet, which may be wrapped in a moment round the whole circumference of a limb if this be thought desirable, while the putty is prevented by the calico from sticking to the rag which is next the sldn.[2] When all discharge has ceased, the use of the paste is discontinued, but the original rag is left adhering to the skin till healing by scabbing is supposed to be complete. I have at present in the hospital a man with severe compound fracture of both bones of the left leg, caused by direct violence, who, after the cessation of the sanious discharge under the use of the paste, without a drop of pus appearing, has been treated for the last two weeks exactly as if the fracture was a simple one. During this time the rag, adhering by means of a crust of inspissated blood collected beneath it, has continued perfectly dry, and it will be left untouched till the usual period for removing the splints in a simple fracture, when we may fairly expect to find a sound cicatrix beneath it.

We cannot, however, always calculate on so perfect a result as this. More or less pus may appear after the lapse of the first week, and the larger the wound, the more likely this is to happen. And here I would desire earnestly to enforce the necessity of persevering with the antiseptic application in spite of the appearance of suppuration, so long as other symptoms are favorable. The surgeon is extremely apt to suppose that any suppuration is an indication that the antiseptic treatment has failed, and that poulticing or water dressing should be resorted to. But such a course would in many cases sacrifice a limb or a life. I cannot, however, expect my professional brethren to follow my advice blindly in such a matter, and therefore I feel it necessary to place before them, as shortly

as I can, some pathological principles intimately connected, not only with the point we are immediately considering, but with the whole subject of this paper.

If a perfectly healthy granulating sore be well washed and covered with a plate of clean metal, such as block tin, fitting its surface pretty accurately, and overlapping the surrounding skin an inch or so in every direction and retained in position by adhesive plaster and a bandage, it will be found, on removing it after twenty-four or forty-eight hours, that little or nothing that can be called pus is present, merely a little transparent fluid, while at the same time there is an entire absence of the unpleasant odour invariably perceived when water dressing is changed. Here the clean metallic surface presents no recesses like those of porous lint for the septic germs to develop in, the fluid exuding from the surface of the granulations has flowed away undecomposed, and the result is the absence of suppuration. This simple experiment illustrates the important fact that granulations have no inherent tendency to form pus, but do so only when subjected to preternatural stimulus. Further, it shows that the mere contact of a foreign body does not of itself stimulate granulations to suppurate; whereas the presence of decomposing organic matter does. These truths are even more strikingly exemplified by the fact that I have elsewhere recorded (Lancet, March 23rd, 1867), that a piece of dead bone free from decomposition may not only fail to induce the granulations around it to suppurate, but may actually be absorbed by them; whereas a bit of dead bone soaked with putrid pus infalliby induces suppuration in its vicinity.

Another instructive experiment is, to dress a granulating sore with some of the putty above described, overlapping the sound skin extensively; when we find, in the course of twenty-four hours, that pus has been produced by the sore, although the application has been perfectly antiseptic; and, indeed, the larger the amount of carbolic acid in the paste, the greater is the quantity of pus formed, provided we avoid such a proportion as would act as a caustic. The carbolic acid, though it prevents decomposition, induces suppuration obviously by acting as a chemical stimulus; and we may safely infer that putrescent organic materials (which we know to be chemically acrid) operate in the same way.

In so far, then, carbolic acid and decomposing substances are alike; viz., that they induce suppuration by chemical stimulation, as distinguished from what may be termed simple inflammatory suppuration, such as that in which ordinary abscesses originate where the pus appears to be formed in consequence of an excited action of the nerves, independently of any other stimulus. There is, however, this enormous difference between the effects of carbolic acid and those of decomposition; viz., that carbolic acid stimulates only the surface to which it is at first applied, and every drop of discharge that forms weakens the stimulant by diluting it; but decomposition is a self-propagating and self-aggravating poison, and, if it occur at the surface of a severely injured limb, it will spread into all its recesses so far as any extravasated blood or shreds of dead tissue may extend, and lying in those recesses, it will become from hour to hour more acrid, till it requires the energy of a caustic sufficient to destroy the vitality of any tissue naturally weak from inferior vascular supply, or weakened by the injury they sustained in the accident.

Hence it is easy to understand how, when a wound is very large, the crust beneath the rag may prove here and there insufficient to protect the raw surface from the stimulating influence of the carbolic acid in the putty; and the result will be first the conversion of the tissues so acted on into granulations, and subsequently the formation of more or less pus. This, however, will be merely superficial, and will not interfere with the absorption and organisation of extravasated blood or dead tissues in the interior. But, on the other hand, should decomposition set in before the internal parts have become securely consolidated, the most disastrous results may ensue.

I left behind me in Glasgow a boy, thirteen years of age, who, between three and four weeks previously, met with a most severe injury to the left arm, which he got entangled in a machine at a fair. There was a wound six inches long and three inches broad, and the skin was very extensively undermined beyond its limits, while the soft parts were generally so much lacerated that a pair of dressing forceps introduced at the wound and pushed directly inwards appeared beneath the skin at the opposite aspect of the limb. From this wound several tags of muscle were hanging, and among them was one consisting of about three inches of the triceps in almost its entire thickness; while the lower fragment of the bone, which was broken high up, was protruding four inches and a half, stripped of muscle, the skin being tucked in under it. Without the assistance of the antiseptic treatment, I should certainly have thought of nothing else but amputation at the shoulder-joint; but, as the radial pulse could be felt and the fingers had sensation, I did not hesitate to try to save the limb and adopted the plan of treatment above described, wrapping the arm from the shoulder to below the elbow in the antiseptic application, the whole interior of the wound, together with the protruding bone, having previously been freely treated with strong carbolic acid. About the tenth day, the discharge, which up to that time had been only sanious and serous, showed a slight admixture of slimy pus; and this increased till (a few days before I left) it amounted to about three drachms in twenty-four hours. But the boy continued as he had been after the second day, free from unfavorable symptoms, with pulse, tongue, appetite, and sleep natural and strength increasing, while the limb remained as it had been from the first, free from swelling, redness, or pain. I, therefore, persevered with the antiseptic dressing; and, before I left, the discharge was already somewhat less, while the bone was becoming firm. I think it likely that, in that boy's case, I should have found merely a superficial sore had I taken off all the dressings at the end of the three weeks; though, considering the extent of the injury, I thought it prudent to let the month expire before disturbing the rag next the skin. But I feel sure that, if I had resorted to ordinary dressing when the pus first appeared, the progress of the case would have been exceedingly different.

The next class of cases to which I have applied the antiseptic treatment is that of abscesses. Here also the results have been extremely satisfactory, and in beautiful harmony with the pathologic-al principles indicated above. The pyogenic membrane, like the granulations of a sore, which it resembles in nature, forms pus, not from any inherent disposition to do so, but only because it is subjected to some preternatural stimulation. In an ordinary abscess, whether acute or chronic, before it is opened the stimulus which

maintains the suppuration is derived from the presence of pus pent up within the cavity. When a free opening is made in the ordinary way, this stimulus is got rid of, but the atmosphere gaining access to the contents, the potent stimulus of decomposition comes into operation, and pus is generated in greater abundance than before. But when the evacuation is effected on the antiseptic principle, the pyogenic membrane, freed from the influence of the former stimulus without the substitution of a new one, ceases to suppurate (like the granulations of a sore under metallic dressing), furnishing merely a trifling amount of clear serum, and, whether the opening be dependent or not, rapidly contracts and coalesces. At the same time any constitutional symptoms previously occasioned by the accumulation of the matter are got rid of without the slightest risk of the irritative fever or hectic hitherto so justly dreaded in dealing with large abscesses.

In order that the treatment may be satisfactory, the abscess must be seen before it is opened. Then, except in very rare and peculiar cases,[3] there are no septic organisms in the contents, so that it is needless to introduce carbolic acid into the interior. Indeed, such a procedure would be objectionable, as it would stimulate the pyogenic membrane to unnecessary suppuration. All that is requisite is to guard against the introduction of living atmospheric germs from without, at the same time that free opportunity is afforded for the escape of the discharge from within.

I have so lately given elsewhere a detailed account of the method by which this is effected (Lancet, July 27th, 1867), that I shall not enter into it at present further than to say that the means employed are the same as those described above for the superficial dressing of compound fractures; viz., a piece of rag dipped into the solution of carbolic acid in oil to serve as an antiseptic curtain, under cover of which the abscess is evacuated by free incision, and the antiseptic paste to guard against decomposition occurring in the stream of pus that flows out beneath it; the dressing being changed daily until the sinus is closed.

The most remarkable results of this practice in a pathological point of view have been afforded by cases where the formation of pus depended on disease of bone. Here the abscesses, instead of forming exceptions to the general class in the obstinacy of the suppuration, have resembled the rest in yielding in a few days only a trifling discharge, and frequently the production of pus has ceased from the moment of the evacuation of the original contents. Hence it appears that caries, when no longer labouring as heretofore under the irritation of decomposing matter, ceases to be an opprobrium of surgery, and recovers like other inflammatory affections. In the publication before alluded to, I have *mentioned* the case of a middle-aged man with a psoas abscess depending in diseased bone, in whom the sinus finally closed after months of patient perseverance with the antiseptic treatment. Since that article was written I have had another instance of abscess equally gratifying, but differing in the circumstance that the disease and the recovery were more rapid in their course. The patient was a blacksmith, who had suffered four and a half months before I saw him from symptoms of ulceration of cartilage in the left elbow. These had latterly increased in severity so as to deprive him entirely of his night's rest and of appetite. I found the region of the elbow greatly swollen, and on careful

examination found a fluctuating point at the outer aspect of the articulation. I opened it on the antiseptic principle, the incision evidently penetrating to the joint, giving exit to a few drachms of pus. The medical gentleman under whose care he was (Dr. Macgregor, of Glasgow) supervised the daily dressing with the carbolic acid paste till the patient went to spend two or three weeks at the coast, when his wife was entrusted with it. Just two months after I opened the abscess, he called to show me the limb, stating that the discharge had been, for at least two weeks, as little as it was then, a trifling moisture upon the paste, such as might be accounted for by the little sore caused by the incision. On applying a probe guarded with an antiseptic rag, I found that the sinus was soundly closed, while the limb was *free* from swelling or tenderness; and, although he had not attempted to exercise it much, the joint could already be moved through a considerable angle. Here the antiseptic principle had effected the restoration of a joint, which, on any other known system of treatment, must have been excised.

Ordinary contused wounds are, of course, amenable to the same treatment as compound fractures, which are a complicated variety of them, I will content myself with mentioning a single instance of this class of cases. In April last, a volunteer was discharging a rifle when it burst, and blew back the thumb with its metacarpal bone, so that it could be bent back as on a hinge at the trapezial joint, which had evidently been opened, while all the soft parts between the metacarpal bones of the thumb and forefinger were torn through. I need not insist before my present audience on the ugly character of such an injury. My house-surgeon, Mr. Hector Cameron, applied carbolic acid to the whole raw surface, and completed the dressing as if for compound fracture. The hand remained free from pain, redness or swelling, and with the exception of a shallow groove, all the wound consolidated without a drop of matter, so that if it had been a clean cut, it would have been regarded as a good example of primary union. The small granulating surface soon healed, and at present a linear cicatrix alone tells of the injury he has sustained, while his thumb has all its movements and his hand a fine grasp.

If the severest forms of contused and lacerated wounds heal thus kindly under the antiseptic treatment, it is obvious that its application to simple incised wounds must be merely a matter of detail. I have devoted a good deal of attention to this class, but I have not as yet pleased myself altogether with any of the methods I have employed. I am, however, prepared to go so far as to say that a solution of carbolic acid in twenty parts of water, while a mild and cleanly application, may be relied on for destroying any septic germs that may fall upon the wound during the performance of an operation; and also that, for preventing the subsequent introduction of others, the paste above described, applied as for compound fractures, gives excellent results. Thus I have had a case of strangulated inguinal hernia in which it was necessary to take away half a pound of thickened omentum, heal without any deep-seated suppuration or any tenderness of the sac or any fever; and amputations, including one immediately below the knee, have remained absolutely free from constitutional symptoms.

Further, I have found that when the antiseptic treatment is efficiently conducted, ligatures may be safely cut short and left to be disposed of by absorption or otherwise.

Should this particular branch of the subject yield to all that it promises, should it turn out on further trial that when the knot is applied on the antiseptic principle, we may calculate as securely as if it were absent on the occurrence of healing without any deep-seated suppuration, the deligation of main arteries in their continuity will be deprived of the two dangers that now attend it, viz., those of secondary haemorrhage and an unhealthy state of the wound, Further, it seems not unlikely that the present objection to tying an artery in the immediate vicinity of a large branch may be done away with; and that even the innominate, which has lately been the subject of an ingenious experiment by one of the Dublin surgeons, on account of its well-known fatality under the ligature for secondary haemorrhage, may cease to have this unhappy character when the tissues in the vicinity of the thread, instead of becoming softened through the influence of an irritating decomposing substance, are left at liberty to consolidate firmly near an unoffending though foreign body.

It would carry me far beyond the limited time which, by the rules of the Association, is alone at my disposal, were I to enter into the various applications of the antiseptic principle in the several special departments of surgery.

There is, however, one point more that I cannot but advert to, viz., the influence of this mode of treatment upon the general healthiness of an hospital. Previously to its introduction the two large wards in which most of my cases of accident and of operation are treated were among the unhealthiest in the whole surgical division of the Glasgow Royal Infirmary, in consequence apparently of those wards being unfavorably placed with reference to the supply of fresh air; and I have felt ashamed when recording the results of my practice, to have so often to allude to hospital gangrene or pyaemia. It was interesting, though melancholy, to observe that whenever all or nearly all the beds contained cases with open sores, these grievous complications were pretty sure to show themselves; so that I came to welcome simple fractures, though in themselves of little interest either for myself or the students, because their presence diminished the pro-portion of open sores among the patients. But since the antiseptic treatment has been brought into full operation, and wounds and abscesses no longer poison the atmosphere with putrid exhalations, my wards, though in other respects under precisely the same circumstances as before, have completely changed their character; so that during the last nine months not a single instance of pyaemia, hospital gangrene, or erysipelas has occurred in them.

As there appears to be no doubt regarding the cause of this change, the importance of the fact can hardly be exaggerated.

NOTES

The addition of a few drops of water to a considerable quantity of the acid, induces it to assume permanently the liquid form.

In order to prevent evaporation of the acid, which passes readily through any organic tissue, such as oiled silk or gutta percha, it is well to cover the paste with a sheet of block tin, or tinfoil strengthened with adhesive plaster. The thin sheet lead used for lining tea chests will also answer the purpose, and may be obtained from any wholesale grocer.

As an instance of one of these exceptional cases, I may mention that of an abscess in the vicinity of the colon, and afterwards proved by postmortem examination to have once communicated with it. Here the pus was extremely offensive when evacuated, and exhibited vibrios under the microscope.

MARKINGS OR FURROWS ON THE NAILS AS THE RESULT OF ILLNESS

Sir Samuel Wilks, M.D.

Samuel Wilks (1824-1911) was an English physician and biographer. He is credited with the first diagnostic account of ulcerative colitis and worked closely with Thomas Addison, Thomas Hodgkin, and Richard Bright. Each famously known for the diseases they discovered because of Wilks' biographies of them. He was Queen Victoria's physician. This paper is an excellent account of furrowed nails in chronic disease. It was published in the *Lancet*, 1, pp. 5-6, in 1869. (White 2009)

The fact that the traces of a past illness may be found on the nails is probably known to many in the profession, as it is one with which I have been well acquainted for many years. Constantly meeting, however, with medical men to whom it is unknown, I take the liberty of bringing the subject before their attention, hoping that the experienced will pardon the intrusion for the sake of those to whom the fact is novel. I cannot at present lay my hands on works of reference, but I believe the subject has been alluded to by English and foreign authors. On taking up the book on "Skin Diseases" by the late lamented Dr. Hillier, I find the following casual allusion to it: "Cross furrows are often seen on the nails. It has been suggested that these are due to an irregular growth of the nail from distrubances of health, the thinner portion being formed when the patient is out of health, and the thicker parts in the intervals." My own distinct knowledge of the fact that the nail become altered in disease was obtained many years ago, when a non-professional gentleman observed the circumstance for himself, and was so much interested in it that he referred the matter to a distinguished natural philosopher. It was after a severe attack of diarrhoea, which caused almost as much prostration as Asiatic cholera, that he discovered a white line or depression at the roots of the nails. Having formed a pretty accurate idea of their rate of growth, he was convinced that the markings corresponded with the date of the illness. I may state that these marks are caused by a slight furrow, which is found more especially on the middle of the nail, and more distinct on that of the thumb. They point no doubt, to a sudden arrest of the nutritive process during the time of the illness, and herein lies the interest of the observation. In cases of fever we know that the most profound changes take place in all the tissues of the body. In scarlet fever, for instance, the whole of the epithelial surface within and without the

body is affected, and, as a result, we may witness a desquamation of the cuticle, falling off of the hair, and separation of the nails. When the fever is at its height, we can have then little doubt of the changes taking place in the tissues, and can feel no surprise that the nails show evidence of the former conflagration. As the patient recovers, and a new cuticle forms, and the hair begins to grow, the nail proceeds to shoot forward afresh, and it is not long before the latter exhibits a transverse furrow, indicative of the previous illness. It is possible, therefore, to ascertain the date of the attack. Physiologists say that the thumb-nail grows its whole length twice in a year; and thus it follows that if the furrow be found in the middle of the nail, the illness occurred three months before. This fact may then serve for a limited period, like "foot-prints on the sands of time," as some additional proof of a previous serious illness. For instance, a patient with cardiac disorder stated that he had had an illness three months before, and on his nails some transverse markings were found; also another suffering from phthisis said that his illness resulted from an inflammation of the lungs occurring a few weeks previously, and on his nails also some distinct lines were discovered. That a severe diarrhoea could produce such a cessation of the nutritive process as to exhibit its effects on the nails is a fact for which I should have been unprepared had it not been apparent to the eyes. It is one, however, of extreme interest. I have never made the subject one of accurate clinical observation; but if I can induce my clinical clerks to record a few cases, the readers of THE LANCET shall be furnished with the result.

ON AN INTERESTING SERIES OF EYE-SYMPTOMS IN A CASE OF SPINAL DISEASE, WITH REMARKS ON THE ACTION OF BELLADONNA ON THE IRIS, ETC.

Douglas Moray Cooper Lamb
Argyll Robertson, M.D., F.R.C.S.

Argyll Robertson (1837-1909) was a Scottish ophthalmologist and surgeon. He did extensive work on the extract of the *Physostigma venenosum* bean and believed it would be most valuable in the ophthalmic pharmacopoeia, which it was proven so. What follows here is his discovery and description of the pathognomonic pupil of neurosyphilis. It was published in the *Edinburgh Medical Journal*, 14, 696-708, in 1869. (White 2009)

The following case illustrates the connexion between spinal disease and certain conditions of the eye, and throws light upon some obscure questions of the physiology, pathology, and therapeutics of the eye.

Robert Halkerston, aet. 59, carver, a spare anaemic man, applied for advice on account of dimness of sight in both eyes, but more especially the right, on the 30th of last October.

History

He has suffered from recurrent attacks of inflammation in his *left* eye for the last twenty years, attended by pain in the eye and temple, and dimness of vision. Ever since the first of these attacks the sight in that eye has remained somewhat obscured. He has also at times suffered from pain in it, without any external appearance of inflammation. The other, the *right* eye, suffered from sympathetic irritation when its neighbour was inflamed, but was never the seat of severe inflammation, and the sight was good in it till a month or six weeks ago, when dimness suddenly supervened, a diffuse uniform mist appearing to envelop objects. This condition has remained without material change to the present time. He has for five years used spectacles of a strength corresponding to his age. He was neither myopic nor hyperopic, and his vision was formerly as good as his neighbours'. From the nature of his occupation his eyes are constantly fixed on his work at a distance of about eighteen inches. He has always been very costive, and is

affected with haemorrhoids, which, however, do not bleed much. He frequently suffers from indigestion and sickness. About two years ago he had a severe attack of frontal tic, and at that time, while out walking one day , he suddenly noticed that he was affected with double vision, which disappeared when one eye was closed. The double vision passed off in the course of a week, and he has had no recurrence of it since. About six months ago, while suffering from frontal tic, he was suddenly seized with giddiness, and with difficulty prevented himself from falling. Two months later he felt his limbs become very weak, while, at the same time, he became affected with cramps in the feet and legs, and numbness as if the limbs were asleep. His gait, too, was unsteady, just as if he had been intoxicated, and he had severe pain in the lumbar region, increased when he walked. His limbs, though still feeble, are, he says, stronger than they were. For several weeks he has had difficulty in retaining his water, and has had to get up at night to avoid wetting the bed; and on taking a drink of water he has generally to go at once to micturate. He states he has no difficulty in making water. He has always been troubled with cold feet in winter. When in the dark, or when he closed his eyes, he noticed he could not stand, but had to grasp at some object for support. He has not observed any failure in the muscular power of his arms. He smokes, but does not, and did not, exceed 2 oz. of twist a week. He used formerly, occasionally, to take ale and spirits to excess, and was then subject to severe headaches. Although affected with "rheumatic" pains, he has never had an attack of rheumatic fever. He is not in the habit of taking opium.

Examination

On examining the eyes, I found both pupils contracted to little more than pin-points, the right rather the smaller of the two. The irides were light-coloured, and apparently healthy in structure. I could not observe any contraction of either pupil under the influence of light, but, on accommodaing the eyes for a near object, both pupils contracted. With the intention of dilating the pupil so as to allow of ophthalmoscopic examination, I applied a drop of a solution of sulphate of atropine, of the strength of four grains to the ounce, to the right eye; but, after waiting twenty minutes, I found that the pupil had scarcely dilated at all, so I put another drop of the same solution into the eye, and desired the patient to return the following day for examination. Next day, October 3I, I found that the pupil of the *right eye* had become partially dilated, so that it now measured almost P 1 /2lines in diameter. It was perfectly circular in form. With this eye he reads very large type (No. xx. of Snellen) at four feet, and large print (No. xii. of Snellen) at one foot distance. On testing him with coloured objects I found that he was quite colour-blind, scarcely recognising the colour of any of a number of objects presented to him. He states that he used formerly to distinguish colours readily. In the *left eye* the pupil was fully half a line in diameter, and circular. There was central nebulous opacity of the cornea of old standing. With this eye he reads very large type (No. xx. of Snellen) at nine feet, and the finest print (No. i. of Snellen) with difficulty at five inches distance. This eye is not so colour-blind as the right, for he can always distinguish

blue, and generally the other colours when of a bright tint, although even then he makes occasional mistakes, having a tendency to call all colours of which he is uncertain yellow or gilt. This symptom has been a source of annoyance to the patient, as it prevents him from distinguishing different woods. He has latterly been unable to distinguish between birch and mahogany. On examining the *right* eye with the ophthalmoscope, the media were found quite clear, the optic disc very white and anaemic, but not in the least excavated, the retinal arteries were quite empty and scarcely discernible, appearing as fine light-coloured lines by the side of the veins, which were partially distended with blood in fact, there were the appearances which are generally considered indicative of embolism of the retinal artery. Neither eye is abnormally sensitive to light, and vision is best in bright daylight. In the dusk he is not able to see sufficiently to guide himself. His field of vision is markedly contracted in both eyes being only about twelve inches in diameter at the distance of a foot and a half from the eye.

On applying the stethoscope over the heart, the first sound was heard to be prolonged, but not accompanied by any bruit. There was no tenderness on pressure over the spine.

As I viewed the case as one of considerable medical interest, I asked Dr. Sanders to examine the patient, which he kindly did on November 2. He found the heart hypertrophied, the sounds unaccompanied by bruit the second sound sharp, almost intoned, over the base of the heart. There was marked pulsation in the suprasternal notch. The pulse was hard and full. No tumour nor swelling of any kind was to be observed in the neck. On making the patient close his eyes while standing, he swayed considerably, but did not stagger. In walking his gait was unsteady, especially in turning.

On November 25, the patient returned, and I applied a drop of solution of sulphate of atropine (gr. iv. to i.) to the left eye. In an hour and a half the pupil measured a line and three-quarters, was of a somewhat oval form, but did not exhibit any adhesions between the iris and the lens. A little uveal pigment projected beyond the pupillary margin of the iris. On examination with the ophthalmoscope. the optic disc was found to be slightly cupped, but the interior of the eye otherwise normal. I now put another drop of the solution of the sulphate of atropine into this eye, and a drop of the extract of the Calabar bean into the other, the pupil of which measured fully half a line. After the lapse of an hour and a half the left pupil still measured the same, while the right pupil had contracted so as to measure only a quarter of a line in diameter, and the patient complained that since the application of the Calabar bean the sight in that eye had been much impaired.

I may further mention that there is no perceptible drooping of the lids, the palpebral openings measuring vertically at the centre 4' 1 i2lines, nor have I ever observed any marked flushing of the face, except on one occasion after the patient had been taking more than usually active exercise. The patient himself states he is not aware of his face flushing more readily than formerly. The sensibility of the face, tob, does not appear to be increased.

There are four points in connexion with this case on which I desire to make some remarks, viz.: The myosis or contraction of the pupil; the effect of belladonna and of Calabar bean on the iris; the colour-blindness; and the condition of the retinal vessels.

I. With regard to the myosis., On first seeing the patient I was struck with the extreme contraction of the pupils, and having previously had one case of myosis apparently dependent on spin-al disease under my own care, and seen several such cases while attending Professor Remak's clinique in Berlin, I was led to suspect the dependence of this symptom on a spinal cause a suspicion which the history of the case verified. The connexion of pupillary contraction with spinal lesions is easily explained by a consideration of the anatomy and physiology of the iris. The iris in the mammalia, as is now universally admitted, contains two sets of nonstriated muscular fibres, the one arranged circularly at its pupillary margin, the other radiating from these circular fibres to the ciliary ligament. By the first the pupil is contracted; it is generally termed the sphincter pupillae muscle, and is under the influence of the motor oculi nerve. By the second the pupil is dilated; it is usually termed the dilatator pupillae muscle, and is under the influence of nervous filaments passing from the spinal cord through the cervical sympathetic to the eye. These fibres are usually termed sympathetic, but I incline to consider them true spinal nerves which, though associated with sympathetic filaments, preserve their own individuality. If they are to be viewed as sympathetic, so should the ciliary nerves which pass from the lenticular ganglion to the eye, but which are referred to the third, fifth, or spinal (sympathetic) nerves, according to the source from which they are derived. In the case just narrated, too, the fibres (so-called sympathetic) which pass to the pupil are those which appear alone to be affected, which is surely an indication that they are distinct from the other filaments; and, as I shall have occasion to mention at another part of this paper, the *vaso-motor* filaments of the sympathetic appear to be paralyzed during the inhalation of the nitrite of amyle, while the *pupillary* fibres remain intact. The fact that division of the cervical sympathetic induced con-traction of the pupil was first discovered by Petit in 1727; while Valentin, and subsequently Budge and Waller, pointed out that the filaments connected with the cervical sympathetic passing to the iris were derived from the spinal cord. The latter observers found that the anterior roots of the two lowest cervical and the six upper dorsal nerves supplied these filaments, and to this portion of the spinal cord they gave the term the "cilio-spinal region." The researches of Brown-Sequard' show that the limits of this area are often more extended, reaching the level of the sixth, seventh, or even the ninth or tenth dorsal vertebrae. Division of the spinal cord in the upper part of this region was found by Budge to produce dilatation of the vessels of the head and neck, just as if the cervical sympathetic had been divided;2 and Budge and Waller have also shown that irritation of the spinal cord between the second and third cervical vertebrae occasions still more powerful contraction of the vessels than irritation of the sympathetic.[3] Now myosis may occur as a pathological condition, either from spasm of the sphincter pupillae, or from weakened action of the dilatator. Apart from inflammatory affections and the use of myotics, we notice myosis as a result of spasm of the sphincter, (1st) in those who, from the nature of their occupation, require to work for lengthened periods at fine objects held close to the eye, in whom the myosis is associated with, and dependent upon, spasm of the accommodation, as is occasionally

noticed among engravers, jewellers, and watchmakers; and (2d) in cases where the retina is over-sensitive to the influence of light.

Myosis may occur from weakness of the dilatator, (1) where, from pressure of tumours in the neck, the functions of the ciliospinal filaments are destroyed; (2) in cases of disease of the cord affecting the cilio-spinal region.

In the case narrated, the nature of the man's occupation was not such as to necessitate a very close inspection of his work, and his retina, so far from being over-sensitive, was decidedly dulled to the influence of light, so that the myosis cannot be ascribed to spasm of the sphincter pupillae. The fact of both pupils being contracted, the absence of any tumour in the neck, and the history of the case, at once exclude the idea of pressure on the sympathetic, and indicate the spinal origin of the myosis.

It is a very curious circumstance that, considering the extent of the cilio-spinal region, injury of any part of which must produce alteration of the pupil, so comparatively few cases of spinal affection are recorded in which this symptom has been observed. I am indebted to Mr. Benjamin Bell for a reference to a case narrated by Sir Benjamin Brodie of a man in whom "there was a small extravasation of blood in the centre of the spinal cord opposite the fifth and sixth cervical vertebrae, and who died in less than forty-eight hours, having been sensible and conscious nearly to the last, but the pupils of his eyes being contracted."[4] Mr. Bell, in a paper in the "Edinburgh Medical Journal" for 1857,[5] also alludes to a case of Dr. Budd's, in which, in consequence of an accident, the spinal cord was converted into red pulpy matter for an inch and a quarter opposite the root of the fifth cervical nerve. The patient died after seven days, and latterly the pupils were contracted. Romberg,[6] in his standard work in the nervous system, makes a mere incidental allusion to the fact that, "in tabes dorsalis, he has found the pupil contracted to the size of a pin's head." At another place, however, he states that he has in tabes repeatedly found a change in the pupils of one or both eyes, consisting in a contraction with loss of motion, which attained to such a height in one case, that the pupils were reduced to a pin's head. I notice too, that, in a case of spinal hemiplegia narrated by Dr. Todd,' a slight difference in the size of the pupils was observed; which, however, he viewed as the only symptom of *brain* affection in the case. Trousseau[8] states that he has often noticed, in cases of progressive locomotor ataxy, in the intervals when the patients are free from pain, an injection of the conjunctiva (sometimes conjunctivitis and chemosis), with contraction of the pupil, reducing it to the smallest possible size, and so powerful sometimes that it resists the influence of belladonna. He further mentions that, during the paroxysm of pain, the contraction is replaced by more or less dilatation of pupil, and generally also the injection of the conjunctiva disappears. Dr. Bazire[9] never found the pupils, however contracted, to resist the dilating effect of atropine, nor has he observed dilatation to occur during a paroxysm of pain, nor was there any injection of the conjunctiva on sclerotic. He mentions, however, that Duchenne has published cases in which these phenomena were present in the intervals between the pains, and disappeared during the paroxysms. Dr. Radcliffe,[10] in two cases of locomotor ataxy, observed that the eyes ceased to be bloodshot, and the pupils opened when the

pain reached a certain degree of severity and had continued for a certain time, but not otherwise. Stellwag von Carion, in his work on Diseases of the Eye," mentions, among causes of the paralytic form of myosis, tabes dorsalis and spinal paralysis. Soelberg Wells,12 too, notices the fact that the "myosis due to paralysis of the dilatator pupillae is met with in those spinal lesions in which the sympathetic nerve is affected, so that its influence on the radio fibres of the iris is impaired."

Brown-Sequard, in the admirable lectures at present being published in the "Lancet," has clearly pointed out the frequent occurrence of higher temperature and increased sensibility of the face and neck, partial closure of the lids, and constricted pupil in cases of spinal hemiplegia, on the side corresponding to the lesion. In three out of seven illustrative cases that he narrates, constriction of the pupil was observed. I am not aware that a variation in the size of the pupil has been noticed in any of the many cases of spinal injury or concussion of the spine resulting from railway accidents, but it appears to me that very weighty positive confirmation might be afforded by the presence of this symptom in cases otherwise doubtful.

A contracted state of one of the pupils is now generally recognised as a common symptom of the presence of a tumour in the neck, interfering with the functions of the sympathetic. The credit of first pointing out the connexion between a myosis and cervical tumour is, I believe, due to Dr. John Reid, who, in a paper in the "Edinburgh Medical and Surgical Journal" for 184I, refers to a case narrated in the "Medical Gazette" for September 1838, where a large tumour involved the carotid, vagus, and surrounding parts, and where the sympathetic could hardly be supposed to escape, and in which the pupil is described as having become smaller in the course of the disease. Dr. F. von Willebrand," in 1854, related a case of unilateral myosis depending on the pressure of enlarged lymphatic on the cervical sympathetic. As the enlargement of the glands subsided under treatment, the pupil became more dilated, until it eventually resumed its natural size. Professor Gairdner[15] has directed special attention to this symptorn in cases of aneurism at the root of the neck, and has related several such cases. Dr. Grainger Stewart showed that this condition existed in a remarkable case of lordosis which he brought before the Edinburgh Medico-Chirurgical Society in July last.

II. The second point to be noticed is the effect produced upon the iris by atropine and the Calabar bean.

Atropine induced dilatation of the pupil, but only to about medium size, thus falling far short of its usual effects; and al-though reapplied it failed to produce any further change. Its action, moreover, was somewhat transient, even the limited dilatations soon disappearing. This want of susceptibility in the iris to the action of belladonna in cases of myosis has been previously observed, and is referred to by Mackenzie,' Trousseau," and Wells)$ Calabar bean produced further contraction of the pupil, reducing its diameter to rather less than one-fourth of a line, an amount of contraction greater than I have seen it produce in any other case.

These actions appear to me to throw some light upon the theory of the effects of these agents; but in order to make this plain, I shall briefly indicate the different theories that exist on this subject, the data on which they were founded, and the objections that may be brought against each.

1. Dr. Fleming maintains1 the view that the iris is an erectile tissue, and that the size of the pupil may be determined by the state of its vessels. He considers that atropine constricts the arteries of the iris, relaxing that membrane, and this constriction and relaxation draws into action, by what he terms functional sympathy (without intervention of brain or cord), the radiating fibres, and dilates the pupil. He bases his theory very much on a series of experiments made by Mr. Wharton Jones which demonstrated that the application of a solution of the sulphate of atropine to the web of a frog's foot induced contraction of the arteries. He also states in corroboration of his view that atropine has no action on the iris of a dead eye. But, in opposition to these views, I would remark that Schneller[20] points out that atropine occasions distention of the vessels of the choroid, and he maintains of the vessels of the iris also. This action he ascribes to paralysis of the ciliary muscle, whereby the intraocular pressure is reduced. By means of an ingenious arrangment, he was enabled to measure exactly the size of the vessels in the interior of the eye, and he made very numerous experiments which placed it beyond doubt that the size of the vessels of the choroid was regulated by the amount of intra-ocular pressure, and that atropia, like paracentesis of the cornea and division of the external muscles of the eyeball, dilated the vessels by diminishing the intra-ocular pressure.

Clinical observation also leads me to doubt the correctness of Dr. Fleming's views, as in a case of glaucoma, in which the pupil was greatly dilated, I found the vessels of the iris extremely distended. Kussmaul[21] also found that when the iris was distended with blood or emptied of it, the pupil still dilated and contracted under the influence of light, and that the pupil may be either contracted or dilated when the iris is in very different states of vascular injection. Moreover, I have satisfied myself by repeated observations, that while nitrite of amyle occasions distention of the vessels of the head and neck it does not occasion any constriction of the pupil. I have frequently observed, on administering nitrite of amyle to rabbits, that while increased injection of the membrana nictitans was distinctly observable, the most careful measurement failed to reveal the slightest alteration in the size of the pupil.

Dr. Fleming, too, is mistaken in the statement that atropine does not act on the iris of the dead eye, as numerous experiments have shown that atropine acts on the iris for some time after the eye-ball has been excised. This is of course fatal to his view.

Donders[22] has also observed the vessels of the iris to contract on irritation of the sympathetic nerve even when, after the action of the Calabar bean, the same irritation scarcely makes the pupil dilate. We are thus forced to conclude, that the state of distention of the vessels of the iris has no marked influence on the size of the pupil.

2. Another view which has been most ably maintained, among others by Mr. Benjamin Bell,23 is that atropine acts by stimulating the radiating fibres to contraction. He founds this view chiefly upon the fact that, in cases of complete paralysis of the third pair when dilated pupil, atropine induces further dilatation, and that when the cervical sympathetic is divided no contraction ensues in a pupil fully dilated by atropine.

Dr. Harley ,[24] in two communications published in reply to Mr. Bell's, relates some experiments in which he divided the sympathetic in the neck, and applied atropine to the cut extremity without producing any effect on the pupil. He also divided the third nerve in a cat, and induced great dilatation, which was not increased by atropine, and on thereafter, dividing the cervical sympathetic the pupil returned to a medium size. From these observations he concluded that atropine acts purely by paralyzing the sphincter pupillae. Harley also divided the cervical sympathetic in the neck after having dilated the pupil thoroughly with atropine, and found that no change was induced in the size of the pupil, but rather views this as corroborating the notion that dilatation depends upon excitation of the radiating fibres. In opposition to the view that atropine acts by stimulating the dilatation merely, we have the fact that atropine administered internally induces paralysis of the motor nerves, affecting first their peripheral extremities.[25] Again, when locally applied to the eye, it induces paralysis of the muscle of accommodation, whcih is sup-plied by filaments of the same nerve as the sphincter pupillae.[26] That the dilatator is irritated is also negatived by the fact pointed out by Budge, that belladonna still acted on the pupil thirteen months after the sympathetic had been divided on that side, and where shortly after death galvanism did not induce dilatation of the pupil as it did in the other eye. The pupil, also, when dilated is immobile, which is rather indicative of a state of paralysis than of spasm. The facts that dilatation of the pupil may be kept up for years, and that even the direct application of galvanism cannot induce contraction in a pupil dilated by atropine, which under ordinary circumstances it would strongly do, are surely indicative of a paralytic change.

3. Some writers suppose that atropine acts simply by paralyzing the sphincter pupillae.[27] Against this it has been urged, that in paralysis of the third pair with dilated pupil atropine induces further dilatation, but this reasoning is not conclusive, because in many cases the paralysis is not complete; and even when the paralysis is complete, unless it be of long standing, the peripheral extremities of the nerve may still retain their sensibility and be capable of being further paralyzed by atropine. That this may occur is evident from the fact, that in excised eyes where all the nerves passing to the iris are removed from thier central connexions, atropine still acts. Another objection raised to this view is, that in birds, in whose irides no dilatation exists, atropine does not induce more than a temporary dilatation. But this also is some-what fallacious, because in birds, where the muscular fibres of the iris are striated, a different type of organization may reasonably be held to exist. Another objection, advanced by Ruyter,[28] is, that on dividing the sympathetic in a rabbit in which the pupils are dilated and stimulating the cut extremity, no further dilatation ensued. But this experiment has been performed by

others with the opposite result; while Zelenski has shown that, though the pupil be fully dilated by atropine, if the animal be poisoned with woorara, at the moment of death still further dilatation ensues, proving that the dilatator if stimulated is capable of still further stimulation. Czermak[29] made a series of experiments which, at first glance, seemed to prove the action of atropine on the radiating fibres. He rapidly removed the cornea from a rabbit which he had just killed, and cut out the circular fibres of the irides, leaving the dilatators intact; he then applied to the one eye a strong solution of the sulphate of atropine, and to the other distilled water. After a time the pupil to which the atropine had been applied was found to be more dilated than the other, from which he concluded that the radiating fibres were stimulated by the atropine to contraction. His reasoning was, however, fallacious, as the increased contraction of the muscle might be due to the direct irritating action of a saline solution. Kolliker,[80] too, had performed similar operations with different results. The only circumstance which, in my opinion, favours the view that atropine stimulates the radiating fibres to contraction is the degree of energy with which dilatation occurs, as exhibited by the tearing though of adhesions between the iris and the lens, which is much beyond what we would naturally ascribe to the simple removal of an antagonistic force.

4. Some writers ascirbe the action of atropine to a combined effect, paralysis of the sphincter and stimulation of the dilatator.' Von Graefe has related a most interesting case of tumour at the base of the brain, in which complete paralysis of the third, fourth, fifth, and sixth nerves on the right side occurred. The pupil was slightly dilated and immobile, and became fully dilated under the use of atropine. From this Von Graefe concludes that atropine acts on the dilatator fibres. At a later period the *left* oculo-motor and trochlear nerves became also paralyzed, and there was *complete* dilatation of the left pupil, which complete dilatation Von Graefe describes as "active" and dependent on coexistent irritation of the sympathetic branches at the base of the skull. Would it not, however, be more natural to ascribe the imperfect dilatation of the right pupil to partial paralysis of the ciliary branches of the third, rather than suppose concomitant irritation of the sympathetic to account for the complete dilatation of the left pupil? Against Von Graefe's view may be reasonably urged the improbability of the same substance exerting contrary actions on identical tissues, while the arguments previously adduced against the theory, that atropine stimulates the radiating fibres, applies of course also to this.

It may seem strange, but some authors maintain that these disputed phenomena are referable to paralysis of both nerves and both muscles." This view is founded on the fact, that galvanism applied to the eye immediately after death gives rise to con-traction of the pupil, but after a short time induces on the contrary dilatation." This would favour the conclusion that the irritability of the motoroculi nerve was sooner lost than that of the ciliospinal. This being the case, atropine is supposed to act by paralyzing both nerves, but the third being more readily affected than the cilio-spinal, dilatation ensues. The energetic dilatation of the pupil tells strongly against this view; and also the fact, that strong doses of atropine, or repeated applications, tend to induce in-creased dilatation, whereas

if it paralyzed both nerves in different degrees, and one subsequently to the other, one would expect a prolonged or free use of atropine would bring the pupil to a medium size.

The last point to which I shall refer is a view propounded by Ludwig, and supported by many, that the atropine acts directly on muscle." This is a question which it is almost impossible definitely to resolve with our present knowledge, because the peripheral extremities of the nerves are so intimately associated with the muscles that it is impossible to separate the actions of agents on muscles from those on nerves. Zelenski,[s]S from a series of very carefully performed experiments with woorara, arrived at the conclusion that an independent muscular irritability is not proven to exist.

In considering the bearings of our case on these different theories, we must keep in mind that in it we have perfect paralysis of the radiating fibres of the iris.[b6]

With regard to Dr. Fleming's view, it is sufficient to state that our case supplies no facts tending to support it. The second theory, that atropine acts purely by stimulating the radiating fibres, is, I think, demonstrated to be erroneous; because if such were the action of atropine in our case, one would not expect a mere medium dilatation of the pupil. For in cases of myosis from spasm, either idiopathic or induced by the Calabar bean, we find atropine to produce its full effects. Thus the diminished effect of atropine contrasts strongly with what I have observed to occur in a case of dilated pupil, the result of paralysis of the sphincter pupillae of long standing, in which the Calabar bean effected an extreme contraction of the pupil. The view that atropine acts by paralyzing the circular fibres receives considerable confirmation, as by this view the effects produced can be best explained. The radiating fibres being originally paralyzed, the pupil is brought to a state of medium dilatation by paralyzing the remaining fibres. Were the view correct, that the circular fibres are paralyzed by belladonna, and the radiating at the same time stimulated, we would, from what I have noticed in the action of the Calabar bean in mydriasis of long standing, look for a dilatation of the pupil in our case somewhat beyond medium size. The case narrated throws no particular light upon the truth or fallacy of the other views.

Where facts and theories are both conflicting, and in many cases contradictory, it is not easy to arrive at a true solution of the problem. With the view of coming to a determinate conclusion on this point, I performed a number of experiments, but found that in each I had been forestalled by previous observers. The most important fact that I elicited from one experiment was a confirmation of Ruyter's view, that stimulation of the cervical sympathetic does not occasion increased dilatation of a pupil fully under the action of atropine; but this requires confirmation. Should it prove correct, I would be inclined to the view that atropine, though it acts mainly by paralyzing the sphincter pupillae, may perhaps secondarily stimulate the dilatator. By another series of experiments with woorara, I obtained similar results to those detailed by Zelenski.

The effect of the Calabar bean in the case of our patient serves to corroborate the view I originally advanced,[g]" that it acts, not by paralyzing the radiating fibres," but by stimulating the circular, as here the dilatator was evidently completely paralyzed.

The *colour-blindness* is not an unfrequent symptom of advancing amaurosis, and I believe would be found to exist far more commonly than is supposed, were patients more

frequently tested on the point, as it is well known that they are often themselves unaware of their defect. As particularly bearing upon our case, I may mention that Dr. Moritz Benedict"9 states, that during two years he has very frequently observed colour-blindness, especially of red and green, along with the amaurosis, accompanying tabes. He narrates six cases in which he found colour-blindness and amaurosis combined, but in none of these were there well-marked signs of spinal disease. A most interesting case bearing upon this subject is narrated by Mr. Poland.[40] A corn-factor brought an action for damages against a railway company on account of injuries received in a collision on their line. In addition to some bruises over the spine, a contusion over the temporal bone and on right shoulder, with loss of power in the arm, the patient complained of numbness of the lower extremities, great depression of spirits, and coloured vision, all objects appearing yellow to him. This last symptom of course seriously interfered with his business, and the jury awarded him 1200 damages. Dr. George Wilson[4'] narrates a case of colour-blindness resulting from a fall from a horse, which was followed by severe nervous symptoms. It would be well, I think, if more attention were paid to this symptom in spinal and other nervous affections. The condition of the Retinal Vessels. The rapidity with which the blindness occurred in the patient's better eye, and the appearances revealed by the ophthalmoscopic examination, sufficiently indicated the nature of the lesion. From some careful anatomical and pathological observations and researches of Dr. Steffan,[42] it would appear that the term embolism of the arteria centralis retinae is not strictly applicable to this and similar cases; for if that artery merely be obstructed, the collateral circulation is sufficiently free to fill the retinal vessels to almost their natural calibre. The cases therefore of complete arterial obstruction are, he maintains, in reality cases of embolism of the *ophthalmic* artery. The fact that the amaurosis depended upon embolism renders it not at all improbable that the spinal affection may be due to a similar cause a hypothesis which the occurrence of some improvement in the patient's symptoms serves to strengthen.

Lectures on the Physiology and Pathology of the Nervous System, 1860, p. 144. 2A dilatation of the vessels of the posterior limb in an animal in whom a lateral half of the spinal cord had been divided, was previously observed by Brown-Sequard in 1857.-Proceedings of the Royal Society, vol. viii. p. 594. [S]Carpenter's Human Physiology, 1864, p. 232.

4 Medico-Chirurgical Transactions, vol. xx, p. I49.

5 Vol. ii. p. 30.

6 Translation published by Sydenham Society, vol. ii. p. 298 and p. 397. [7]Clinical Lectures on Paralysis, etc., 1856, p. 338.

6 Clin. Medicine, Bazire, vol. i. p. 149.

9 *Op. cit.,* p. 205.

º Reynold's System of Medicine, vol. ii. p. 345. "English translation, 1868, p. 642.

2 Treatise on Diseases of the Eye, 1869, p. 164.

5 See "Lancet" of November 7th and 21st, and December 12th, 1868. 14Archiv fur Ophthalm., band i. abth. i. p. 319.

15 Edin. Med. Journal, January and August 1855.

16 Treatise on Diseases of the Eye, 1854, p. 883.

17 *0p cit.,* p. 149.

16 Op. *cit., p.* 164.

9 Inquiry into the Action and Uses of Atropia. Edin. Med. Jour., March 1863. 2OEin Mikrometer am Augenspiegel, etc. Archiv fur Ophthal., band iii. abth. ii. p. 155.

21 Quoted by Schneller. *Loc. cit.,* p. 132.

22 Accommodation and Refraction of the Eye, p. 580.

25 Edin. Med. Journal, vol. ii. pp. 30, 52I, and 815.

24 Edin. Med. Journal, vol. ii. pp. 431 and 705.

25 Botkin, Ueber die Physiol. Wirkung des Schwefels. Atropins. Virchow's Archiv, band xxiv. p. 83.

26 That the third is the nerve of accommodation is now almost universally admitted, and is indicated by the fact, that in complete paralysis of that nerve the power of adjusting the eye to distances is always limited, while the experiments by Dr. von Frautvetter (Archiv f. Ophth., band xiii. abth. i. p. 95) have positively demonstrated that in birds, when the third nerve is irritated, the lens becomes more convex, while irritation of other nerves fails to produce any effect on that structure.

27 Budge, Ueber die bewegungen der Iris, etc., 1855; Braun, Archiv f. Ophth., band v. abth. ii. p. 112; Hirschmann, Reichert et Du Bois-Reymond's Archie, 1863, p. 309.

29 De Actione Atropae Belladonnae in Iridem. Quoted by Czermak.

29 Kleine Mittheilungen aus dem k. k. Physiol. Institute in Pesth, zweite and dritte reihe. Moleschott's Untersuch-ungen, band vii. 1861.

3 Zeitschr. f. Wissensch. Zoologie, band vi. 1855, p. 143.

5 'Czermak, *loc. cit.;* Von Graefe, Archiv fur Ophthalm., band vii. abth. ii. p. 24. s2Zelenski, Zur Frage von der Muskelirritabilitat. Virchow's Archiv, band. xxiv. p. 362.

33 Ruyter, *op. cit.*

34 Harley, Edin. Med. Journal, vol. ii. p. 705.

35 Op. cit.

36 That the myosis was not due to increased distention of the vessels of the iris is, I think, evident from the fact that no such distention was visible either in the iris itself or neighbouring parts, and also the curious fact, that while the right pupil was somewhat more contracted than the left, the supply of blood to the right eye by the ophthalmic artery appears to have been obstructed. (The reasons for this supposition are given further on.)

37 The Calabar Bean as a New Agent in Ophthalm. Medicine. Ed. Med. Journal, March 1863.

38 Dr. T. R. Fraser on the Ordeal Bean of Calabar. Ed. Med. Journal, July, August, and September 1863.

39 Der Daltonismus bei Schnerven-Atrophie. Archiv f. Ophth., band. x. abth. ii. p. 185.

40 Roy. Lond. Ophth. Hosp. Reports, vol. iii. p. 259.

41 Researches on Colour-Blindness, 1855, p. 38.

42 Ueber Embolische Retinalveranderungen. Arch. f. Ophth., band. xii. abth. i. p. 34.

ON DISEASE OF THE MAMMARY AREOLA PRECEDING CANCER OF THE MAMMARY GLAND

Sir James Paget, 1st Baronet, F.R.S.

James Paget (1814-1899) was a British surgeon and physiologist. He is considered one of the founders of modern pathology. This description of a finding of eczema preceding breast cancer is an important contribution to medicine. It was published in the *St. Bartholomew's Hospital Report*, 10, pp. 87-89, in 1874. (White 2009)

I believe it has not yet been published that certain chronic affections of the skin of the nipple and areola are very often succeeded by the formation of scirrhous cancer in the mammary gland. I have seen about fifteen cases in which this has happened, and the events were in all of them so similar that one description may suffice.

The patients were all women, various in age from 40 to 60 or more years, having in common nothing remarkable but their disease. In all of them the disease began as an eruption on the nipple and areola. In the majority it had the appearance of a florid, intensely red, raw surface, very finely granular, as if nearly the whole thickness of the epidermis were removed; like the surface of very acute diffuse eczema, or like that of an acute balanitis.

From such a surface, on the whole or greater part of the nipple and areola, there was aways copious, clear, yellowish, viscid exudation. The sensations were commonly tingling, itching, and burning, but the malady was never attended by disturbance of the general health. I have not seen this form of eruption extend beyond the areola, and only once have seen it pass into deeper ulceration of the skin after the manner of a rodent ulcer.

In some of the cases the eruption has presented the characters of an ordinary chronic eczema, with minute vesications, succeeded by soft, moist, yellowish scabs or scales, and constant viscid exudation. In some it has been like psoriasis, dry, with a few white scales slowly desquamating; and in both these forms, especially in the psoriasis, I have seen the eruption spreading far beyond the areola in widening circles, or, with scattered blotches of redness, covering nearly the whole breast.

I am not aware that in any of the cases which I have seen the eruption was different from what may be described as long-persistent eczema, or psoriasis, or by some other

name, in treatises on diseases of the skin; and I believe that such cases some-times occur on the breast, and after many months' duration are cured, or pass by, and are not followed by any other disease. But it has happened that in every case which I have been able to watch, cancer of the mammary gland has followed within at the most two years, and usually within one year. The eruption has resisted all the treatment, both local and general, that has been used, and has continued even after the affected part of the skin has been involved in the cancerous disease.

The formation of cancer has not in any case taken place first in the diseased part of the skin. It has always been in the substance of the mammary gland, beneath or not far from the diseased skin, and always with a clear interval of apparently healthy tissue.

In the cancers themselves, I have seen in these cases nothing peculiar. They have been various in form; some acute, some chronic, the majority following an average course, and all tending to the same end; recurring if removed, affecting lymph-glands and distant parts, showing nothing which might not be written in the ordinary history of cancer of the breast.

The single noteworthy fact found in all these cases is that which I have stated in the first sentence, and I think it deserves careful study. For the sequence of cancer after the chronic skin-disease is so frequent that it may be suspected of being a consequence, and must be always feared, and may be sometimes almost certainly foretold. I believe that a nearly similar sequence of events may be observed in other parts. I have seen a persistent "rawness" of the glans penis, like a long-enduring balanitis, followed after more than a year's duration by cancer of the substance of the glans. A chronic soreness or irritation (of whatever kind) on the surface of the lower lip often long precedes cancer in its substance; and, with a frequency surprassing all other cases of the kind, the superficial syphilitic diseases of the tongue are followed, and not superseded, by cancers which do not always appear to commence in a diseased part of the tongue. For an explanation of these cases it may be suggested that a superficial disease induces in the structures beneath it, in the course of many months, such degeneracy as makes them apt to become the seats of cancer; and that this is chiefly likely to be observed in the cases of those structures which appear to be, naturally, most liable to cancer, as the mammary gland, the tongue, and the lower lip. One may suspect that similar surface-irritation has much to do with the frequency of cancer of the rectum, pylorus, and ileo-caecal valve, in any of which parts the degeneracy, which might come naturally in old age and make them apt for cancer, may be hastened, and made prematurely sufficient, by an adjacent disturbance of nutrition. In practice, the question must be sometimes raised whether a part through whose disease or degeneracy cancer is very likely to be induced should not be removed. In the member of a family in which cancer has frequently occurred, and who is at or beyond middle age, the risk is certainly very great that such an eruption on the areola as I have described will be followed within a year or two by cancer of the breast. Should not, then, the whole diseased portion of skin be destroyed or removed as soon as it appears incurable by milder means? I have had this done in two cases, but, I think, too late. Or, again, when one with a marked family-liability to cancer has

syphilitic disease of the mucous membrane of the tongue, with frequent recurrences of inflammation, should not all the worst pieces of the membrane be removed? I should certainly advise it, especially if the membrane were ichthyotic, if it were not that the disease is commonly so extensive that good scar-tissue would not be likely to be formed, and that bad scar-tissue, often irritable and ulcerating, is as likely to induce.cancer as the syphilitic or ichthyotic patches would have been.

THE GERM THEORY AND ITS APPLICATIONS TO MEDICINE AND SURGERY

Louis Pasteur

Louis Pasteur (1822-1895) was a French microbiologist and chemist. His experiments supported the germ theory. Pasteur created the first vaccine for rabies and is considered on of the founders of microbiology. Presented here is his famous paper read before the French Academy of Sciences on April 29th, 1878, and published as *Comptes rendus de l'Académie des Sciences,* lxxxvi., pp. 1037-43, in 1878 with translation reference from Vol. XXXVIII, Part 7. The Harvard Classics. New York: P.F. Collier & Son, 1909 14. (White 2009)

Louis Pasteur was born at Dôle, Jura, France, December 27, 1822, and died near Saint-Cloud, September 28, 1895. His interest in science, and especially in chemistry, developed early, and by the time he was twenty-six he was professor of the physical sciences at Dijon. The most important academic positions held by him later were those as professor of chemistry at Strasburg, 1849; dean of the Faculty of Sciences at Lille, 1854; science director of the École.

THE SCIENCES gain by mutual support. When, as the result of my first communications on the fermentations in 1857-1858, it appeared that the ferments, properly so-called, are living beings, that the germs of microscopic organisms abound in the surface of all objects, in the air and in water; that the theory of spontaneous generation is chimerical; that wines, beer, vinegar, the blood, urine and all the fluids of the body undergo none of their usual changes in pure air, both Medicine and Surgery received fresh stimulation. A French physician, Dr. Davaine, was fortunate in making the first application of these principles to Medicine, in 1863.

It was necessary therefore to attempt to cultivate the septic vibrio either in a vacuum or in the presence of inert gases such as carbonic acid.

Results justified our attempt; the septic vibrio grew easily in a complete vacuum, and no less easily in the presence of pure carbonic acid.

These results have a necessary corollary. If a fluid containing septic vibrios be exposed to pure air, the vibrios should be killed and all virulence should disappear. This is actually the case. If some drops of septic serum be spread horizontally in a tube and in a very thin

layer, the fluid will become absolutely harmless in less than half a day, even if at first it was so virulent as to produce death upon the inoculation of the smallest portion of a drop.

Furthermore all the vibrios, which crowded the liquid as motile threads, are destroyed and disappear. After the action of the air, only fine amorphous granules can be found, unfit for culture as well as for the transmission of any disease whatever. It might be said that the air burned the vibrios.

If it is a terrifying thought that life is at the mercy of the multiplication of these minute bodies, it is a consoling hope that Science will not always remain powerless before such enemies, since for example at the very beginning of the study we find that simple exposure to air is sufficient at times to destroy them.

But, if oxygen destroys the vibrios, how can septicemia exist, since atmospheric air is present everywhere? How can such facts be brought in accord with the germ theory? How can blood, exposed to air, become septic through the dust the air contains?

All things are hidden, obscure and debatable if the cause of the phenomena be unknown, but everything is clear if this cause be known. What we have just said is true only of a septic fluid containing adult vibrios, in active development by fission: conditions are different when the vibrios are transformed into their germs, that is into the glistening corpuscles first described and figured in my studies on silk-worm disease, in dealing with worms dead of the disease called flachérie. Only the adult vibrios disappear, burn up, and lose their virulence in contact with air: the germ corpuscles, under these conditions, remain always ready for new cultures, and for new inoculations.

All this however does not do away with the difficulty of understanding how septic germs can exist on the surface of objects, floating in the air and in water.

Where can these corpuscles originate? Nothing is easier than the production of these germs, in spite of the presence of air in contact with septic fluids.

If abdominal serous exudate containing septic vibrios actively growing by fission by exposed to the air, as we suggested above, but with the precaution of giving a substantial thickness to the layer, even if only one centimeter be used, this curious phenomenon will appear in a few hours. The oxygen is absorbed in the upper layers of the fluid as is indicated by the change of color. Here the vibrios are dead and disappear. In the deeper layers, on the other hand, towards the bottom of this centimeter of septic fluid we suppose to be under observation, the vibrios continue to multiply by fission protected from the action of oxygen by those that have perished above them: little by little they pass over to the condition of germ corpuscles with the gradual disappearance of the thread forms. So that instead of moving threads of varying length, sometimes greater than the field of the microscope, there is to be seen only a number of glittering points, lying free or surrounded by a scarcely perceptible amorphous mass. Thus is formed, containing the latent germ life, no longer in danger from the destructive action of oxygen, thus, I repeat, is formed the septic dust, and we are able to understand what has before seemed so obscure; we can see how putrescible fluids can be inoculated by the dust of the air, and how it is that putrid diseases are permanent in the world.

The Academy will permit me, before leaving these interesting results, to refer to one of their main theoretical consequences. At the very beginning of these researches, for they reveal an entirely new field, what must be insistently demanded? The absolute proof that there actually exist transmissible, contagious, infectious diseases of which the cause lies essentially and solely in the presence of microscopic organisms. The proof that for at least some diseases, the conception of spontaneous virulence must be forever abandoned as well as the idea of contagion and an infectious element suddenly originating in the bodies of men or animals and able to originate diseases which propagate themselves under identical forms: and all of those opinions fatal to medical progress, which have given rise to the gratuitous hypotheses of spontaneous generation, of albuminoid ferments, of hemiorganisms, of archebiosis, and many other conceptions without the least basis in observation. What is to be sought for in this instance is the proof that along with our vibrio there does not exist an independent virulence belonging to the surrounding fluids or solids, in short that the vibrio is not merely an epiphenomenon of the disease of which it is the obligatory accompaniment. What then do we see, in the results that I have just brought out? A septic fluid, taken at the moment that the vibrios are not yet changed into germs, loses its virulence completely upon simple exposure to the air, but preserves this virulence, although exposed to air on the simple condition of being in a thick layer for some hours. In the first case, the virulence once lost by exposure to air, the liquid is incapable of taking it on again upon cultivation: but, in the second case, it preserves its virulence and can propagate, even after exposure to air. It is impossible, then, to assert that there is a separate virulent substance, either fluid or solid, existing, apart from the adult vibrio or its germ. Nor can it be supposed that there is a virus which loses its virulence at the moment that the adult vibrio dies; for such a substance should also lose its virulence when the vibrios, changed to germs, are exposed to the air. Since the virulence persists under these conditions it can only be due to the germ corpuscles the only thing present. There is only one possible hypothesis as to the existence of a virus in solution, and that is that such a substance, which was present in our experiment in non-fatal amounts, should be continuously furnished by the vibrio itself, during its growth in the body of the living animal. But it is of little importance since the hypothesis supposes the forming and necessary existence of the vibrio.

I hasten to touch upon another series of observations which are even more deserving the attention of the surgeon than the preceding: I desire to speak of the effects of our microbe of pus when associated with the septic vibrio. There is nothing more easy to superpose, as it were-two distinct diseases and to produce what might be called a *septicemic purulent infection,* or a *purulent septicemia.* Whilst the microbe-producing pus, when acting alone, gives rise to a thick pus, white, or sometimes with a yellow or bluish tint, not putrid, diffused or enclosed by the so-called *pyogenic membrane,* not dangerous, especially if localized in cellular tissue, ready, if the expression may be used for rapid resorption; on the other hand the smallest abscess produced by this organism when associated with the septic vibrio takes on a thick gangrenous appearance, putrid, greenish and infiltrating the softened tissues. In this case the microbe of pus carried so

to speak by the septic vibrio, accompanies it throughout the body: the highly-inflamed muscular tissues, full of serous fluid, showing also globules of pus here and there, are like a kneading of the two organisms.

By a similar procedure the effects of the anthrax bacteridium and the microbe of pus may be combined and the two diseases may be superposed, so as to obtain a purulent anthrax or an anthracoid purulent infection. Care must be taken not to exaggerate the predominance of the new microbe over the bacteridium. If the microbe be associated with the latter in sufficient amount it may crowd it out completely prevent it from growing in the body at all. Anthrax does not appear, and the infection, entirely local, becomes merely an abscess whose cure is easy. The microbe-producing pus and the septic vibrio (not) being both anaërobes, as we have demonstrated, it is evident that the latter will not much disturb its neighbor. Nutrient substances, fluid or solid, can scarcely be deficient in the tissues from such minute organisms. But the anthrax bacteridium is exclusively aërobic, and the proportion of oxygen is far from being equally distributed throughout the tissues: innumerable conditions can diminish or exhaust the supply here and there, and since the microbe-producing pus is also aërobic, it can be understood how, by using a quantity slightly greater than that of the bacteridium it might easily deprive the latter of the oxygen necessary for it. But the explanation of the fact is of little importance: it is certain that under some conditions the microbe we are speaking of entirely prevents the development of the bacteridium.

Summarizing, it appears from the preceding facts that it is possible to produce at will, purulent infections with no elements of putrescence, putrescent purulent infections, anthracoid purulent infections, and finally combinations of these types of lesions varying according to the proportions of the mixtures of the specific organisms made to act on the living tissues.

These are the principal facts I have to communicate to the Academy in my name and in the names of my collaborators, Messrs. Joubert and Chamberland. Some weeks ago (Session of the 11th of March last) a member of the Section of Medicine and Surgery, M. Sedillot, after long meditation on the lessons of a brilliant career, did not hesitate to assert that the successes as well as the failures of Surgery find a rational explanation in the principles upon which the germ theory is based, and that this theory would found a new Surgery, already begun by a celebrated English surgeon, Dr. Lister, who was among the first to understand its fertility. With no professional authority, but with the conviction of a trained experimenter, I venture here to repeat the words of an eminent *confrère.*

ON THE EXTENSION OF THE GERM THEORY TO THE ETIOLOGY OF CERTAIN COMMON DISEASES

Louis Pasteur

Louis Pasteur (1822-1895) was a French microbiologist and chemist. His experiments supported the germ theory. Pasteur created the first vaccine for rabies and is considered one of the founders of microbiology. Presented here is his essay as read before the French Academy of Sciences on May 3, 1880 and published as *Comptes rendus de l'Académie des Sciences,* xc., pp. 103-3 44, in 1880 with translation reference from Vol. XXXVIII, Part 7. The Harvard Classics. New York: P.F. Collier & Son, 1909 14. (White 2009)

WHEN I began the studies now occupying my attention, I was attempting to extend the germ theory to certain common diseases. I do not know when I can return to that work. Therefore in my desire to see it carried on by others, I take the liberty of presenting it to the public in its present condition.

I. Furuncles. In May, 1879, one of the workers in my laboratory had a number of furuncles, appearing at short intervals, sometimes on one part of the body and sometimes on another. Constantly impressed with the thought of the immense part played by microscopic organisms in Nature, I queried whether the pus in the furuncles might not contain one of these organisms whose presence, development, and chance transportation here and there in the tissues after entrance would produce a local inflammation, and pus formation, and might explain the recurrence of the illness during a longer or shorter time. It was easy enough to subject this thought to the test of experiment.

First observation., On June second, a puncture was made at the base of the small cone of pus at the apex of a furuncle on the nape of the neck. The fluid obtained was at once sowed in the presence of pure air of course with the precautions necessary to exclude any foreign germs, either at the moment of puncture, at the moment of sowing in the culture fluid, or during the stay in the oven, which was kept at the constant temperature of about 35 C. The next day, the culture fluid had become cloudy and contained a single organism, consisting of small spherical points arranged in pairs, sometimes in fours, but often in irregular masses. Two fluids were preferred in these experiments chicken and yeast bouillon. According as one or the other was used, appearances varied a little. These

should be described. With the yeast water, the pairs of minute granules are distributed throughout the liquid, which is uniformly clouded. But with the chicken bouillon, the granules are collected in little masses which line the walls and bottom of the flasks while the body of the fluid remains clear, unless it be shaken: in this case it becomes uniformly clouded by the breaking up of the small masses from the walls of the flasks.

Second observation., On the tenth of June a new furuncle made its appearance on the right thigh of the same person. Pus could not yet be seen under the skin, but this was already thickened and red over a surface the size of a franc. The inflamed part was washed with alcohol, and dried with blotting paper passed through the flame of an alcohol lamp. A puncture at the thickened portion enabled us to secure a small amount of lymph mixed with blood, which was sowed at the same time as some blood taken from the finger of the hand. The following days, the blood from the finger remained absolutely sterile: but that obtained from the center of the forming furuncle gave an abundant growth of the same small organism as before.

Third observation., The fourteenth of June, a new furuncle appeared on the neck of the same person. The same examination, the same result, that is to say the development of the microscopic organism previously described and complete sterility of the blood of the general circulation, taken this time at the base of the furuncle outside of the inflamed area.

At the time of making these observations I spoke of them to Dr. Maurice Reynaud, who was good enough to send me a patient who had had furuncles for more than three months. On June thirteenth I made cultures of the pus from a furuncle of this man. The next day there was a general cloudiness of the culture fluids, consisting entirely of the preceding parasite, and of this alone.

Fourth observation., June fourteenth, the same individual showed me a newly forming furuncle in the left axilla: there was widespread thickening and redness of the skin, but no pus was yet apparent. An incision at the center of the thickening showed a small quantity of pus mixed with blood. Sowing, rapid growth for twenty-four hours and the appearance of the same organism. Blood from the arm at a distance from the furuncle remained completely sterile.

June 17, the examination of a fresh furuncle on the same individual gave the same result, the development of a pure culture of the same organism.

Fifth observation., July twenty-first, Dr. Maurice Reynaud informed me that there was a woman at the Lariboisière hospital with multiple furuncles. As a matter of fact her back was covered with them, some in active suppuration, others in the ulcerating stage. I took pus from all of these furuncles that had not opened. After a few hours, this pus gave an abundant growth in cultures. The same organism, without admixture, was found. Blood from the inflamed base of the furuncle remained sterile.

In brief, it appears certain that every furuncle contains an aërobic microscopic parasite, to which is due the local inflammation and the pus formation that follows.

Culture fluids containing the minute organism inoculated under the skin of rabbits and guinea-pigs produce abscesses generally small in size and that promptly heal.

As long as healing is not complete the pus of the abscesses contains the microscopic organism which produced them. It is therefore living and developing, but its propagation at a distance does not occur. These cultures of which I speak, when injected in small quantities in the jugular vein of guinea-pigs show that the minute organism does not grow in the blood. The day after the injection they cannot be recovered even in cultures. I seem to have observed as a general principle, that, provided the blood corpuscles are in good physiological condition it is difficult for aërobic parasites to develop in the blood. I have always thought that this is to be explained by a kind of struggle between the affinity of the blood corpuscles for oxygen and that belonging to the parasite in cultures. Whilst the blood corpuscles carry off, that is, take possession of all the oxygen, the life and development of the parasite become extremely difficult or impossible. It is therefore easily eliminated, digested, if one may use the phrase. I have seen these facts many times in anthrax and chicken-cholera, diseases both of which are due to the presence of an aërobic parasite.

Blood cultures from the general circulation being always sterile in these experiments, it would seem that under the conditions of the furuncular diathesis, the minute parasite does not exist in the blood. That it cannot be cultivated for the reason given, and that it is not abundant is evident; but, from the sterility of the cultures reported (five only) it should not be definitely concluded that the little parasite may not, at some time, be taken up by the blood and transplanted from a furuncle when it is developing to another part of the body, where it may be accidentally lodged, may develop and produce a new furuncle. I am convinced that if, in cases of furuncular diathesis, not merely a few drops but several grams of blood from the general circulation could be placed under cultivation frequent successful growths would be obtained. In the many experiments I have made on the blood in chicken-cholera, I have frequently demonstrated that repeated cultures from droplets of blood do not show an even development even where taken from the same organ, the heart for example, and at the moment when the parasite begins its existence in the blood, which can easily be understood. Once even, it happened that only three out of ten chickens died after inoculation with infectious blood in which the parasite had just begun to appear, the remaining seven showed no symptoms whatever. In fact, the microbe, at the moment of beginning its entrance into the blood may exist singly or in minute numbers in one droplet and not at all in its immediate neighbor. I believe therefore that it would be extremely instructive in furunculosis, to find a patient willing to submit to a number of punctures in different parts of the body away from formed or forming furuncles, and thus secure many cultures, simultaneous or otherwise, of the blood of the general circulation. I am convinced that among them would be found growths of the micro-organism of furuncles.

II. On Osteomyelitis. Single observation. I have but one observation relating to this severe disease, and in this Dr. Lannelongue took the initiative. The monograph on osteomyelitis published by this learned practitioner is well known, with his suggestion of the possibility of a cure by trephining the bone and the use of antiseptic washes and dressings. On the

fourteenth of February, at the request of Dr. Lannelongue I went to the Sainte-Eugènie hospital, where this skillful surgeon was to operate on a little girl of about twelve years of age. The right knee was much swollen, as well as the whole leg below the calf and a part of the thigh above the knee. There was no external opening. Under chloroform, Dr. Lannelongue made a long incision below the knee which let out a large amount of pus; the tibia was found denuded for a long distance. Three places in the bone were trephined. From each of these, quantities of pus flowed. Pus from inside and outside the bone was collected with all possible precautions and was carefully examined and cultivated later. The direct microscopic study of the pus, both internal and external, was of extreme interest. It was seen that both contained large numbers of the organism similar to that of furuncles, arranged in pairs, in fours and in packets, some with sharp clear contour, others only faintly visible and with very pale outlines. The external pus contained many pus corpuscles, the internal had none at all. It was like a fatty paste of the furuncular organism. Also, it may be noted, that growth of the small organism had begun in less than six hours after the cultures were started. Thus I saw, that it corresponded exactly with the organism of furuncles. The diameter of the individuals was found to be one one-thousandth of a millimeter. If I ventured to express myself so I might say that in this case at least the osteomyelitis was really a furuncle of the bone marrow. It is undoubtedly easy to induce osteomyelitis artificially in living animals.

III. On puerperal fever., First observation. On the twelfth of March, 1878, Dr. Hervieux was good enough to admit me to his service in the Maternity to visit a woman delivered some days before and seriously ill with puerperal fever. The lochia were extremely fetid. I found them full of micro-organisms of many kinds. A small amount of blood was obtained from a puncture on the index finger of the left hand, (the finger being first properly washed and dried with a *sterile* towel), and then sowed in chicken bouillon. The culture remained sterile during the following days.

The thirteenth, more blood was taken from a puncture in the finger and this time growth occurred. As death took place on the sixteenth of March at six in the morning, it seems that the blood contained a microscopic parasite at least three days before.

The fifteenth of March, eighteen hours before death, blood from a needle-prick in the left foot was used. This culture also was fertile.

The first culture, of March thirteenth, contained only the organism of furuncles; the next one, that of the fifteenth, contained an organism resembling that of furunculosis, but which always differed enough to make it easy usually to distinguish it. In this way; whilst the parasite of furuncles is arranged in pairs, very rarely in chains of three or four elements, the new one, that of the culture of the fifteenth, occurs in long chains, the number of cells in each being indefinite. The chains are flexible and often appear as little tangled packets like tangled strings of pearls.

The autopsy was performed on the seventeenth at two o'clock. There was a large amount of pus in the peritoneum. It was sowed with all possible precautions. Blood from

the basilic and femoral veins was also sowed. So also was pus from the mucous surface of the uterus, from the tubes, and finally that from a lymphatic in the uterine wall. These are the results of these cultures: in all there were the long chains of cells just spoken of above, and nowhere any mixture of other organisms, except in the culture from the peritoneal pus, which, in addition to the long chains, also contained the small pyogenic vibrio which I describe under the name *organism of pus* in the Note I published with Messrs. Joubert and Chamberland on the thirtieth of April, 1878.

Interpretation of the disease and of the death., After confinement, the pus that always naturally forms in the injured parts of the uterus instead of remaining pure becomes contaminated with microscopic organisms from outside, notably the organism in long chains and the pyogenic vibrio. These organisms pass into the peritoneal cavity through the tubes or by other channels, and some of them into the blood, probably by the lymphatics. The resorption of the pus, always extremely easy and prompt when it is pure, becomes impossible through the presence of the parasites, whose entrance must be prevented by all possible means from the moment of confinement.

Second observation., The fourteenth of March, a woman died of puerperal fever at the Lariboisière hospital; the abdomen was distended before death.

Pus was found in abundance by a peritoneal puncture and was sowed; so also was blood from a vein in the arm. The culture of pus yielded the long chains noted in the preceding observation and also the small pyogenic vibrio. The culture from the blood contained only the long chains.

Third observation., The seventeenth of May, 1879, a woman, three days past confinement, was ill, as well as the child she was nursing. The lochia were full of the pyogenic vibrio and of the organism of furuncles, although there was but a small proportion of the latter. The milk and the lochia were sowed. The milk gave the organism in long chains of granules, and the lochia only the pus organism. The mother died, and there was no autopsy.

On May twenty-eighth, a rabbit was inoculated under the skin of the abdomen with five drops of the preceding culture of the pyogenic vibrio. The days following an enormous abscess formed which opened spontaneously on the fourth of June. An abundantly cheesy pus came from it. About the abscess there was extensive induration. On the eighth of June, the opening of the abscess was larger, the suppuration active. Near its border was another abscess, evidently joined with the first, for upon pressing it with the finger, pus flowed freely from the opening in the first abscess. During the whole of the month of June, the rabbit was sick and the abscesses suppurated, but less and less. In July they closed; the animal was well. There could only be felt some nodules under the skin of the abdomen.

Interpretation of the disease and of the death. The injury of the uterus during confinement as usual furnished pus, which gave a lodging place for the germs of the long chains of granules. These, probably through the lymphatics, passed to the joints and to some other places, thus being the origin of the metastatic abscesses which produced death.

Fifth observation., On June seventeenth, M. Doléris, a wellknown hospital interne, brought to me some blood, removed with the necessary precautions, from a child dead immediately after birth, whose mother, before confinement had had febrile symptoms with chills. This blood, upon cultivation, gave an abundance of the pyogenic vibrio. On the other hand, blood taken from the mother on the morning of the eighteenth (she had died at one o'clock that morning) showed no development whatever, on the nineteenth nor on following days. The autopsy on the mother took place on the nineteenth. It is certainly worthy of note that the uterus, peritoneum and intestines showed nothing special, but the liver was full of metastatic abscesses. At the exit of the hepatic vein from the liver there was pus, and its walls were ulcerated at this place. The pus from the liver abscesses was filled with the pyogenic vibrio. Even the liver tissues, at a distance from the visible abscesses, gave abundant cultures of the same organism.

Interpretation of the disease and of the death., The pyogenic vibrio, found in the uterus, or which was perhaps already in the body of the mother, since she suffered from chills before confinement, produced metastatic abscesses in the liver and, carried to the blood of the child, there induced one of the forms of infection called purulent, which caused its death.

Sixth observation., The eighteenth of June, 1879, M. Doléris informed me that a woman confined some days before at the Cochin Hospital, was very ill. On the twentieth of June, blood from a needle-prick in the finger was sowed; the culture was sterile. On July fifteenth, that is to say twenty-five days later, the blood was tried again. Still no growth. There was no organism distinctly recognizable in the lochia: the woman was nevertheless, they told me, dangerously ill and at the point of death. As a matter of fact, she did die on the eighteenth of July at nine in the morning: as may be seen, after a very long illness, for the first observations were made over a month before: the illness was also very painful, for the patient could make no movement without intense suffering.

An autopsy was made on the nineteenth at ten in the morning, and was of great interest. There was purulent pleurisy with a considerable pocket of pus, and purulent false membranes on the walls of the pleura. The liver was bleached, fatty, but of firm consistency, and with no apparent metastatic abscesses. The uterus, of small size, appeared healthy; but on the external surface whitish nodules filled with pus were found. *There was nothing in the peritoneum, which was not inflamed;* but there was much pus in the shoulder joints and the symphysis pubis.

The pus from the abscesses, upon cultivation, gave the long chains of granules not only that of the pleura, but that from the shoulders and a lymphatic of the uterus as well. An interesting thing, but easily understood, was that the blood from a vein in the arm and taken three-quarters of an hour after death was entirely sterile. Nothing grew from the Fallopian tubes nor the broad ligaments.

Interpretation of the disease and of the death., The pus found in the uterus after confinement became infected with germs of microscopic organisms which grew there, then passed into the uterine lymphatics, and from there went on to produce pus in the pleura and in the articulations.

Seventh observation., On June eighteenth, M. Doléris informed me that a woman had been confined at the Cochin Hospital five days before and that fears were entertained as to the results of an operation that had been performed, it having been necessary to do an embryotomy. The lochia were sowed on the 18th; there was not the slightest trace of growth the next day nor the day after. Without the least knowledge of this woman since the eighteenth, on the twentieth I ventured to assert that she would get well. I sent to inquire about her. This is the text of the report: *The woman is doing extremely well; she goes out tomorrow.*

Interpretation of the facts., The pus naturally formed on the surface of the injured parts did not become contaminated with organisms brought from without. *Natura medicatrix* carried it off, that is to say the vitality of the mucous surfaces prevented the development of foreign germs. The pus was easily resorbed, and recovery took place.

I beg the Academy to permit me, in closing, to submit certain definite views, which I am strongly inclined to consider as legitimate conclusions from the facts I have had the honor to communicate to it.

Under the expression *puerperal fever* are grouped very different diseases, but all appearing to be the result of the growth of common organisms which by their presence infect the pus naturally formed on injured surfaces, which spread by one means or another, by the blood or the lymphatics, to one or another part of the body, and there induce morbid changes varying with the condition of the parts, the nature of the parasite, and the general constitution of the subject.

Whatever this constitution, does it not seem that by taking measures opposing the production of these common parasitic organisms recovery would usually occur, except perhaps when the body contains, before confinement, microscopic organisms, in contaminated internal or external abscesses, as was seen in one striking example (fifth observation). The antiseptic method I believe likely to be sovereign in the vast majority of cases. It seems to me that *immediately after confinement* the application of antiseptics should be begun. Carbolic acid can render great service, but there is another antiseptic, the use of which I am strongly inclined to advise, this is boric acid in concentrated solution, that is, four per cent. at the ordinary temperature. This acid, whose singular influence on cell life has been shown by M. Dumas, is so slightly acid that it is alkaline to certain test papers, as was long ago shown by M. Chevreul, besides this it has no odor like carbolic acid, which odor often disturbs the sick. Lastly, its lack of hurtful effects on mucous membranes, notably of the bladder, has been and is daily demonstrated in the hospitals of Paris. The following is the occasion upon which it was first used. The Academy may remember that I stated before it, and the fact has never been denied, that ammoniacal urine is always produced by a microscopic organism, entirely similar in many respects to the organism of furuncles. Later, in a joint investigation with M. Joubert, we found that a solution of boric acid was easily fatal to these organisms. After that, in 1877, I induced Dr. Guyon, in charge of the genito-urinary clinic at the Necker hospital, to try injections of a solution of boric acid in affections of the bladder. I am informed by this skillful practitioner that he has done so, and daily observes good results from it.

He also tells me that he performs no operation of lithotrity without the use of similar injections. I recall these facts to show that a solution of boric acid is entirely harmless to an extremely delicate mucous membrane, that of the bladder, and that it is possible to fill the bladder with a warm solution of boric acid without even inconvenience.

To return to the confinement cases. Would it not be of great service to place a warm concentrated solution of boric acid, and compresses, at the bedside of each patient; which she could renew frequently after saturating with the solution, and this also after confinement. It would also be acting the part of prudence to place the compresses, before using, in a not air oven at 150 C., more than enough to kill the germs of the common organisms.

Was I justified in calling this communication *On the extension of the germ theory to the etiology of certain common diseases?* I have detailed the facts as they have appeared to me and I have mentioned interpretations of them: but I do not conceal from myself that, in medical territory, it is difficult to support one's self wholly on subjective foundations. I do not forget that Medicine and Veterinary practice are foreign to me. I desire judgment and criticism upon all my contributions. Little tolerant of frivolous or prejudiced contradiction, contemptuous of that ignorant criticism which doubts on principle, I welcome with open arms the militant attack which has a method in doubting and whose rule of conduct has the motto More light.

It is a pleasure once more to acknowledge the helpfulness of the aid given me by Messrs. Chamberland and Roux during the studies I have just recorded. I wish also to acknowledge the great assistance of M. Doléris.

ON CYCLIC ALBUMINURIA (ALBUMINURIA IN THE APPARENTLY HEALTHY)

Frederick William Pavy, M.D., LL D., F.R.S., F.R.C.P.

William Pavy (1829-1911) was a British physician, as well as, an expert on diabetes. He discovered a cyclic or recurrent physiologic albuminuria in healthy people. His original findings are presented here in there original form by BMJ Publishing Group Permissions: F. W. Pavy, 1885, British Medical Journal, pp. 789-791. (White 2009)

Attention has been recently given to a form of albuminuria which has been spoken of as "albuminuria in the apparently healthy," "physiological albuminuria," "intermittent albuminuria," and by my colleague, Dr. Moxon, in the *Guy's Hospital Reports, vol. xiii,* third series, "Albuminuria of Adolescents." It is important that the albuminuria in question should be distinguished from the ordinary form of albuminuria, as the gravity of the two is diametrically opposed. Several cases have, during the last six years, fallen under my notice, and I have observed in them a character which has served as a ground of distinction, and enabled me to express an opinion at the commencement which has been verified by the advance of time. The character to which I refer is the diurnal alteration that takes place in the condition of the urine. Examined at one period of the twenty-four hours, the urine is found to contain, it may be, a large amount of albumen, whilst, at other periods, there is none, and what is observed one day is repeated with more or less closeness to the next. These cases thus have a cyclic character belonging to them, hence my adoption of the term "cyclic albuminuria" as the heading of this communcation. It appears to me an appropriate one to employ for the purpose of classification. The description to be given of what is noticeable is as follows. In the early morning, the urine is free from albumen; albumen then shows itself, it may be at 9, 10, or 11 A.M., or not till the early part of the afternoon. After reaching its maximum it declines, and often by the evening has disappeared. It is rare to find that it has not disappeared by bedtime. The period of diurnal appearance is, without too closely limiting it, pretty uniform for each case; some days the amount may be observed to fall, and then rise again; also there may be considerable variation in the amount of albumen observed upon different days. The condition noticed may go on, not only for weeks and months, but even for years.

It is not accompanied by any impairment of health, and there are none of the ordinary constitutional indications of the existence of Bright's disease present. In some cases, I have noticed that there has been a sharp and unduly forcible cardiac impulse, but the pulse has been soft, and not hard and sustained as in Bright's disease. Such being the history belonging to the albuminuria in question, there is nothing to lead in a direct manner to its recognition, and it is generally in an incidental way that it becomes brought into view. The urine, in other respects, presents ordinary characters. No casts of tubules are to be observed, but frequently crystals of oxalate of lime are present.

It is not surprising that the condition should excite grave looks and the shurgging of shoulders on the part of members of the profession, which give alarm to the patient; but there is nothing to show, from the experience that has yet been gained, that it is to be regarded as an early stage of Bright's disease, or that it leads on to anything serious.

The kind of albumen present in several of the cases has not been simply seralbumen, but a mixture of caseiform or alkali-albumen with seralbumen.

I do not propose, at the present moment, to offer any theory in explanation of these cases. Analogous phenomena are, however, noticeable in the case of persons subject to the phosphatic diathesis. Here the urine voided may be perfectly bright and clear in the early morning, whilst, for a few hours after breakfast, it is turbid from the deposition of phosphates, and becomes clear again in the afternoon, and remains so till the following day after breakfast, when the same cyclic course of events is repeated. Again, without our being able to account for it by the operation of external influences, a diurnal variation occurs in a regular manner in the temperature of the body. An illustration is here afforded of a physiological cyclic change; and other illustrations showing the tendency in this direction might be adduced.

I will now supply the details of a few cases selected from those which have fallen under my notice.

In the spring of 1881, Mr. O. T., a tall, well built, well nourished, healthy-looking young man, twenty-one years of age, discovered the existence of albumen in his urine. He was engaged in practical chemical work, and was led to examine his own urine when suffering from a temporary attack of lumbar pain. To his dismay he found albumen present, and for some time was in a state of mental distress about it. When the case fell under my observation, I desired that specimens of urine passed at different periods of the twenty-four hours should be brought to me for examination, and recognised the case to be one of the class I am describing. Frequent examinations of the urine were made, and, at one time, this was done for three weeks on every consecutive day. What was observed was this. The urine passed on rising in the morning was never found to contain albumen. Sometimes as early as 10 or 11 A.M., but at other times not till about 2 P.M., albumen began to be perceptible.

On first being found the quantity was slight, but went on increasing till usually about 6 P.M., when the maximum point was reached. It afterwards declined, and usually, on going to bed, the urine was free from albumen, or, if it contained any, it was only a trace. Breakfast was taken at 8 A.M., lunch at 2 P.M., and dinner at 6 P.M. Beyond the

presence of albumen, the urine presented normal characters, except that it threw down oxalate of lime crystals. Casts of tubules were never found. There was no constitutional evidence of Bright's disease; the pulse was soft; there was undue cardiac impulse, but it was sharp, and not heaving.

Such was the condition existing in 1881, and, being desirous of knowing whether it had disappeared or not, I wrote in March of the present year, and requested that I might be afforded the opportunity of again examining the urine. I received in reply as follows: "In answer to your request of yesterday, I shall be very pleased to do anything I can to be of service to you. For a short time I tested my urine frequently, with the same results. I then gave it up, as I found it only led to my getting mentally uneasy , so that, for the last three years, I have never tested for albumen. I will try to come to see you soon, as you request. We are so busy just at present, that I am afraid I cannot well get away during business-hours. However, I will try one day next week, and, in the meantime, will make a few more tests of the urine passed at different periods, and let you know the results when I see you."

On the following week I received a visit from Mr. O. T. He brought with him specimens of urine, and told me he had found that the old condition still existed in the same form as before; the urine being free from albumen in the morning till about noon, the maximum amount being present between 4 and 6 P.M., and the urine being free again at bedtime, or, if not absolutely free, only containing a trace. I examined the specimens brought, and the results obtained confirmed this statement, but the afternoon urine contained less albumen than I had noticed previously. This might have been incidental. The bodily health was good in every way. There had been no illness during the four years that had elapsed, and no deviation from the state before observed was perceptible.

I have again procured specimens just previously to the Association meeting, so as to bring the report of the case up to the present time. The urine passed at 8 A.M., July 20th, was free from albumen. That passed at noon contained a trace; that passed at 5 P.M. a considerable amount, and that on going to bed a trace. The same kind of condition that was before noted, therefore, still exists.

In July, 1883, Mr. T. W. R., aged 18, was brought to me by his father, with the history that he had recently successfully gone through the examination for a civil service appointment in one of the British possessions, and, on afterwards presenting himself for medical examination, was not passed, on account of the presence of albumen in his urine. He had been at Cheltenham College, and had been reckoned as one of the healthiest there, engaging freely in the different sports pursued by the students, without the thought having occurred to himself or others that anything wrong existed with him. The urine passed at the time of consultation, about the middle of the morning, contained a light amount of albumen. I desired that specimens passed at different periods should be sent for examination, and it was found that the early morning urine was free from albumen, whilst albumen was present in notable amount at 1 P.M., and about again at bedtime.

Examinations were made July 19th and 30th, and August 4th, 8th, and 30th; they all agreed in showing the early morning urine to be free from albumen. The amount varied in

the early after-noon urine, and by the end of the evening the urine had become free from albumen, or only contained just a perceptible trace. Microscopic examination revealed the presence of oxalate of lime crystals, and no casts. The result of this examination was communicated to the authorities in Whitehall, and I was asked to meet the medical advisers (two of the most distinguished persons in the profession) of the Board at a time appointed for the candidate to attend. This, as at the previous medical examination, was, unfortunately for the candidate, in the afternoon, and, as was to be anticipated, the urine voided at this time for examination contained albumen. Had it happened that the medical examination, in the first instance, had been conducted during the early part of the morning, the candidate would have undoubtedly been passed without any question being raised, for there was nothing beyond the condition of the urine that had been described against him. I expressed and recoded in writing my conviction, from what I had seen in other cases, that the candidate's condition was not to be looked upon in the light of ordinary albuminuria, and that it would not interfere with his continuing in the possession of health and ordinary working power. He was not, however, accepted. He had one more chance left him, which was to go in for the examination again in the following year, which his age just permitted. This he did, and came out in a higher position amongst his competitors than at the previous one. When he afterwards attended to be medically examined, his urine was free from albumen, and he was passed. In the previous March, it had been examined, and was also found free. I have just (July 1st, 1885) obtained an opportunity of seeing the person, and examining the urine. Four specimens were brought, derived from what was passed at 7:30 A.M., 1:30 P.M., 5 P.M., and 13.30 P.M. Under ordinary testing they would all be pronounced to be free from albumen, but, with scrutinous attention, the 1.30 P.M. and 5 P.M. specimens showed just a discoverable impairment of brightness, and the 5 P.M. specimen more so than the other. There had been an uninterrupted enjoyment of good health, and the bodily condition was in every respect satisfactory.

T.F.H., aged 49, consulted me in February, 1882, with the history that he was the subject of albuminuria, and that it had been noticed that albumen was present at one time, and not at another. Although his bodily health had not suffered, he had been advised to give up hunting and shooting, and otherwise adopt an invalid mode of life. He had been in the habit of examining his urine himself, with heat and nitric acid, and came with the statement that albumen was to be found between break-fast and lunch, but not in the early morning or at bedtime, or, if at bedtime, only to the extent of a trace. Finding, by my own examinations, that this statement was correct, I gave a different prognosis from that which had been given to him before, and recommended him to lead a prudent but ordinary mode of life, both as regards excerise and diet. I have watched the progress of this case, and examined the urine from time to time. I notice, in my casebook, that, in June, 1883, all the five specimens brought were free from albumen. The last visit to me was in May of the present year, and again I see the report that no albumen was to be found. The general health was good.

In November, 1881, W. H., aged 19, was brought to me by his local medical attendant on account of the presence of albumen in his urine. He had already been taken

to a physician, and the father had been alarmed by being told, in answer to an inquiry about the future employment of his son, that he had no future of any duration to look forward to. Investigation showed that, in the early part of the morning, the urine was non-albuminous. Soon after breakfast, albumen began to be perceptible, and, a little later on, was more abundant. Usually at bedtime, the urine was free from albumen, but sometimes a trace was found. In March, 1882, the condition of the urine was the same. There was no sign of any impairment of health. In December, 1883, I was afforded an opportunity of examining the urine again, and there was then an absence of albumen.

C. M., aged 19, appeared in good health, but albumen had been discovered in his urine when being examined for life-assurance. I saw him in consultation in March, 1883, and it had been previously noticed by the medical practitioner that the albumen was not always present. The early morning specimen was free, whilst, after breakfast, albumen was found.

Last week, a gentleman, aged 28, came to me with a letter from a medical practitioner. The letter is dated Liverpool, July 20th, 1885. It runs as follows. "About a week ago, I found albumen in the urine of the bearer. The specimen I examined was passed in the evening, he having had a meat-tea, and played a few games of lawn-tennis. The albumen produced a decided milkiness with picric acid and heat, also with nitric acid, and left a deposit after twelve hours' standing equal to about one-tenth of the urine. The urine was acid; specific gravity 1025; no sugar; no casts, but a very abundant deposit of octohedral crystals of oxalate of lime. The urine passed the following morning fasting has the merest trace of albumen. In the evening, a few days later, the albumen had returned. I had not examined it in the interim. The following morning fasting no albumen, but after breakfast, consisting of sole and an egg, the albumen had returned in somewhat larger proportion . . . . So much for the present condition. About four years ago, his life was refused by an assurance-society. I examined his urine at that time, and found some sugar in it a very little, but he has heard that the assurance medical examiner found albumen. He was treated by my late partner some months, and you then saw him, and saw nothing wrong with his urine."

Reference to my case-book shows that this person came to me in 1881, with the history that sugar had been found in his urine. At the time of his visit, his urine was free from sugar. I put him upon a test-diet for a few days, that is, desired him to partake freely of starchy and saccharine matters; and, still finding his urine free from sugar, I told him that he might consider that he was not the subject of diabetes. He has now come to me as the subject of albuminuria, and my own observation shows, as had been noticed by the medical practitioner who sent him to me, that it is only during a part of the twenty-four hours that his urine contains albumen. The urine passed on rising in the morning of July 24th was of specific gravity 1030, with no albumen, and 6.804 per 1,000 of acidity. At 11 A.M., the condition was specific gravity 1024, considerably amount of albumen, and acidity 1.701 per 1,000. At 5 P.M., specific gravity 1031, less albumen, and acidity 6.048 per 1,000. At bedtime, specific gravity 1023, faint trace of albumen, and acidity 2,520 per 1,000.

July 25th. On rising, there was again an absence of albumen, the specific gravity was 1030, and the acidity 6.930 per 1,000. Microscopically, the only abnormal condition

discoverable in the several specimens was the presence of crystals of oxalate of lime. Such is the information as yet obtained, and upon it I judge the case to fall in the category of those I have been describing. Much to the relief of the patient, I expressed this opinion to him. He is of a highly excitable temperament, and was in an exceedingly anxious state about himself. It is curious that he should have come to me first with reference to sugar, and now with reference to albumen; and I hope it will turn out that the encouraging terms in which I spoke to him with regard to the latter will prove as well founded as they did with regard to the former.

A case fell under my notice a few months ago, in which a first impression, based upon a statement of the patient that he was suffering from albuminuria, and that it had been observed that his urine was free from albumen in the early part of the morning, was found, on full investigation, to be erroneous. It was a case of a gentleman, aged 48, with a gouty family history, and a presumption that he himself owed his troubles to gout. Albumen had been discovered in his urine in 1879, when seeking advice from a physician regarding the most suitable continental watering-place to visit. Ever since this time, albumen has been known to exist, and, as I have mentioned, the patient came to me with the statement that, in the early morning , the urine was free from albumen. He was the subject of alarming attacks of what he called faintness, of so severe a character as to lead him to think that he was in imminent danger of death from stoppage of the heart. Upon one occasion, when driving in the park, an attack occurred, and he was taken to the house of Dr. Fothergill. I was glad that he fell into the hands of a person so capable of observing the nature of the condition existing, and I learnt from his patient that, notwithstanding the kind of feeling he experienced, his heart was found to be beating forcibly, and he told me that Dr. Fothergill had referred the attack to contraction or spasm of the cerebral vessels. I see Dr. Fothergill present, and perhaps he remembers the case. As far as the general condition was concerned, the symptoms were suggestive of the existence of gouty or granular kidney, but the urine was of normal quantity, colour, and specific gravity, and, at its maximum, only contained a slight amount of albumen. My own examination confirmed the statement that had been made, except that, on scrutinous inspection, the existence of a faint trace of albumen was perceptible in the morning urine. The microscope, however, revealed the presence of casts of tubules, and this carried the case at once out of the group I am describing.

In what I have stated about cyclic albuminuria, I do not mean to imply that this is the only form of albuminuria which is associated with the apparently healthy state. On the contrary, I am of opinion that albumen may be persistently present, and yet not necessarily mean that a grave condition exists. I have seen cases which have afforded grounds for this conclusion. The subject is one which requires the light of further inquiry to be thrown upon it.

Dr. FOTHERGILL (London) said that every medical man possessed of common sense was glad to hear any man who was willing to lay the axe to the root of that demoralising superstition, that albuminuria necessarily involved disease of the kidneys.

Dr. JAMES BARR (Liverpool) drew attention to the mechanical nature of the transudation of albumen. Dr. Barr believed that, in those cases, the albuminuria depended on excess of pressure within the glomeruli. If a fluid were free to move (of course, there was no fluid perfectly mobile), the driving force applied to this fluid increased the velocity, and diminished the lateral pressure; the latter depending on the statical condition of the fluid. In cases of physiological albuminuria, the central propelling organ was weak; and, although the tension in the arteries was not usually very high, yet there was a want of tone in the arteries, and there was a greater obstruction to the circulation than the weak heart was able to overcome. This want of freedom to the outflow of blood increased the statical pressure, and diminished the velocity of the blood-flow; so that the pressure within the glomeruli was increased, and the velocity diminished. This view readily explained the cyclical motion of the transudation; when the patient was in bed, there was greater freedom to the circulation, and less work for the heart; so that the pressure within the Malpighian tufts was not sufficient to transude albumen. When the patient rose in the morning, the heart had more work to do, both on account of the exertion and of the sudden inrush of fluid to the blood-vessels; and consequently the circulation became more sluggish, and the statical condition of the blood increased. In the treatment of these cases, the more attention was paid to the general condition of the patient and the state of the circulation, the better results would be got.

Dr. DAVIES THOMAS (Adelaide) said that the question of the presence of albumen in the apparently healthy was one of great practical importance to the medical advisers of life-assurance societies, and to those who were frequently called upon to advise the acceptance or rejection of candidates for various appointments. It might very properly be dealt with by the Collective Investigation Committee. The inquiry should extend over a long period.

Dr. W. R. THOMAS (Sheffield) stated that he had noticed that, in cyclic albuminuria, there was generally an increased quantity of salts in the urine. The professional man who did the bulk of his work in the morning, found that the urine passed about two o'clock in the afternoon contained not only albumen, but also a greater quantity of phosphates than that passed at other times. Again, those who went through a great amount of physical work, passed not only albumen, but also urates, etc., in larger quantities at that time than at other times during the day. He, therefore, rather felt inclined to think that whenever, in these cases, the kidneys had increased work to do, it would always be followed by increased excretion of salts and albumen.

Dr. BULKLEY (New York) wished to corroborate, from his own personal experience, the statement which had been made that the occurrence of albumen in the urine was not always of the grave significance often supposed. In 1868, he had had very severe acute albuminuria, with blood, which slowly disappeared, so that, in a few months, he was apparently well. A second attack followed a few months later, from which he recovered.

Then, for a period of several years, he occasionally found albumen in the urine, and often not. He had been twice examined and accepted for life-insurance, as a first-class risk; he supposed that the urine had chanced to be examined, possibly, during one of the intervals of freedom in cyclic albuminuria. His health, of late years, had been perfect.

Dr. TYSON (Folkestone) said that he had acute nephritis eleven years ago; after which, albuminuria remained for many months, which passed off slowly, yet surely. Yet two causes exposure to draughts, and an excessive meat-diet would now bring on a sickening pain in the left loin; not so much now as formerly. It was possibly due to a stretching of the capsule from congestion. He did not think that there was albumen, as his health was good in every way.

Mr. S. B. FARR (Andover) related the case of a patient who experienced a severe attack of congestion of the kidneys through exposure to cold in November, about four years ago. Animal or any other diet did not produce albuminuria, but beer and wine would do so. The patient had previously been the subject of gout

BAKER'S CYST: THE FORMATION OF ABNORMAL SYNOVIAL CYSTS IN CONNECTION WITH THE JOINTS (SECOND COMMUNICATION)

WILLIAM MORRANT BAKER, M.D.

William Baker (1839-1896) was an English physician and served as Sir James Paget's assistant. He was considered as an expert in renal surgery, particularly nephrolitomy. His findings were published in *St. Bartholomew's Hospital Reports*, 21, pp. 177-190, in 1885. (White 2009)

In the 13th volume of the St. Bartholomew's Hospital Reports I drew attention to the formation of synovial cysts in the leg as a consequence of disease, especially osteo-arthritis, of the knee-joint; and I ventured to deduce from an examination of the cases there related the following conclusions:

> That in cases of effusion into the knee-joint, and especially in those in which the primary disease is osteo-arthritis, the fluid secreted may find its way out of the joint, and form by distension of neighbouring parts a synovial cyst of large or small size.

That the synovial cyst so produced may occupy (a) the popliteal space and upper part of the calf of the leg, or may (b) be evident in the calf of the leg only, projecting most, as a rule, on the inner aspect of the leg as a small defined swelling, not approaching within three or four inches of any part of the knee-joint.

That however large the synovial cyst may be, fluctuation may not be communicable from it to the interior of the knee-joint; but the absence of such fluctuation must not be taken to contraindicate the existence of a connection between the joint and the cyst.

That the synovial cyst may be expected to disappear after a longer or shorter period, without leaving traces of its existence, even on dissection of the limb.

That the cyst should not be punctured or otherwise subjected to operation, unless there appear strong reasons for so doing, inasmuch as interference may lead to acute inflammation and suppuration of the knee-joint.

That most often the disease in the knee-joint will be found to have begun some time before the appearance of the secondary synovial cyst; but sometimes the patient's

attention may be first drawn to the latter, or the cyst may seem for a long period the more important part of the disease.

In the course of the eight years which have elapsed since the publication of my paper, I have met with many other cases of these synovial cysts in connection with the knee, and have found the preceding conclusions amply confirmed by further experience.

With reference to the route taken by the synovial fluid when escaping from the interior of the joint, I suggested in my former communication that it is probably one determined in many cases by definite anatomical conditions, especially those connected with the tendons respectively of the semi-membranosus and the popliteus muscles, although in others the starting-point may be a "hernia" of the synovial membrane in some other situation.

The following account of two dissections, since made by Mr. D'Arcy Power, appears to show that the suggestions then offered were correct:

> The first case was that of a man (under the care of Mr. Thomas Smith), aet. 44, who had suffered from pain in the left knee-joint for a period of two years before its amputation. "At some time between March and October 1884 a swelling appeared in the calf of the leg, behind and below the head of the fibula. In October the swelling was punctured and a few drops of blood with some glairy fluid were removed, but there was no pus. He stated that many years before he had rheumatism in his shoulder. On admission into St. Bartholomew's Hospital his symptoms were recorded by Mr. Bowlby as follows:, The knee is stiff, and, as the patient lies, the leg is at right angles with the thigh. The head of the tibia is enlarged and the patella is displaced outwards. A fluctuating swelling about the size of half an orange is situated behind and below the head of the fibula, extending into the popliteal space. A sinus in the middle of this swelling constantly discharges pus. The skin over it is red and inflamed.'

"On opening the knee joint after amputation of the leg, about half an ounce of pus escaped.

"The cartilage covering the external condyle of the femus is ulcerated in patches . . ."

"The synovial membrane is much thickened, and in parts has grown over the upper portion of the femoral condyles. It is slightly pedunculated, the tufts of synovial membrane being well defined. The crucial ligaments are destroyed. There is no lipping or eburnation of the bones in any part, and the cartilage, upon microscopic examination, does not appear to be fibrillated.

"On the outer side of the spine of the tibia is a passage through which a probe can be passed downwards, backwards, and slightly inwards, through the posterior ligament, into a sac containing about four ounces of a thick curdy pus." . . .

"The cyst lies beneath the gastronemius muscle in the situation of the popliteus. It is, I believe, the popliteus muscle, which itself has been gradually distended until all traces of muscular sub-stance have disappeared." . . .

"Near the outer edge of the plantaris, at the back of the joint, is a well-marked hernia or pouch of the synovial membrane, which has protruded between the fibres of the ligamentum posticum."

Mr. Power comes to the conclusion that in this case the formation of the cyst in the leg was preceded by that of a hernia of the synovial membrane of the knee-joint, and that "as the swelling increased in size its course was directed by the popliteus muscle."

In the second case, that of a girl, aet. 22 (under the care of Mr. Langton), "On the inner side of the leg, commencing at a point two inches below the inner condyle and extending downwards for about six inches, was a fluctuating swelling. This swelling, the patient said, had existed for about six weeks, and was getting larger. The skin over it was normal. No communication could be detected between the swelling and the knee-joint. The swelling was punctured, and three ounces of puriform viscid fluid were drawn off. Three weeks later the swelling was again punctured, and an ounce of very viscid fluid was with difficulty removed."

(The preceding note was made by Mr. J. L. Hewer.)

"The leg was amputated. Subsequent dissection showed that, as in the previous case, the joint was completely disorganised." . . .

"The bones showed no signs of rheumatoid change, and no history of rheumatoid or other affection could be obtained from the patient.

"On the posterior surface of the joint two openings are visible. The one situated at the back of the internal condyle, immediately above the inner head of the gastrocnemius, is large enough to admit a lead pencil. The opening is part of a canal which lead from a cyst into the connective tissue surrounding the muscles at the back of the thigh." . . .

"The second aperture is situated in the tendon of the inner head of the gastrocnemius; it is somewhat below and a little to the inner side of the preceding, and is in communication with the cyst. By an opening in communication with this channel a connection is formed between the cyst and the knee-joint, through which a probe can be passed beneath the internal condyle of the femur." . . .

"The cyst measures 4 by 3 inches. It appears to have been formed by an enlargement of the bursa which naturally exists beneath the semi-membranosus muscle, and in this instance may have communicated with the knee-joint. The enlargement had taken place in the connective tissue on the inner side of the gastrocnemius muscle, and some of the fibres of this muscle form its inner and posterior wall."'

My object in the present paper is to direct attention to the fact that abnormal synovial cysts are formed in connection with other joints than the knee; that, like those met with in connection with the latter joint, they may present many difficulties in diagnosis; and that these difficulties may lead a surgeon astray as to both prognosis and treatment.

At the time of my previous contribution on this subject to the Hospital Reports, I had not noticed the disease except in the neighbourhood of the knee. Since that period, I have seen it in connection with the shoulder, the elbow, and the hip joints.

Regarding the wrist-joint and the ankle, I am not so sure. In connection with the former I can recall one case at least, which was probably identical in nature; but it occurred many years ago, and I have not preserved any detailed record of it.

Case I
Disease, Probably Osteo-Arthritis, of the RightShoulder—Joint,with Consecutive Synovial Cyst in the Upper Arm

A healthy-looking man (E. S.), aet. 24,s was admitted, under my care, into St. Bartholomew's Hospital on September 26, 1883, on account of a fluctuating swelling, supposed to be an abscess, in the upper arm. He had applied at the surgery on the previous day, complaining of the swelling in the arm, and stating that three months ago he first noticed pain, which struck upwards to the shoulder. Soon afterwards he noticed the lump, of about the size, at that time, of a hen^{s} egg, and this had gradually increased in size. The swelling, which at the time of his admission measured about 4 inches in length by 3 in breadth, was situated at about the middle of the upper arm in front, immediately over the biceps muscle, to which it seemed to be adherent. It fluctuated readily, and was formed obviously by a sac of some kind containing fluid. It had been punctured on the previous day in the surgery by a grooved needle, and a small quantity of thin straw-coloured fluid had escaped. There was slight redness of the skin over the swelling, but it nowhere "pointed" like an abscess. At this time no complaint was made regarding the shoulder-joint, and nothing regarding its condition was recorded in the notes.

(Three years previously the patient had undergone amputation of the thigh on account of "white swelling" of the knee-joint. Beyond this there was nothing apparently worth noting in his previous history, unless that he had had an abscess in each groin about four years ago, and that he had had small-pox.)

From the general character of the swelling, and the absence of complaint on the part of the patient of any symptom which might have guided one to a different diagnosis, I came to the conclusion that the tumour must be either a simple cyst or a chronic abscess, and gave directions that it should be again punctured. The house-surgeon accordingly punctured it with a tenotomy knife. About two ounces of straw-coloured fluid escaped first; then the fluid became blood-stained, and this was followed by the escape of about a dessert-spoonful of curdy lymph or pus.

On examination the fluid was found faintly alkaline, and be-came solid on boiling. Mixed with liq. potassae it became slightly gelatinous. The pus (?) was slightly soluble in cold liq potassae, and completely so on boiling.

(The urine was normal. Sp. gr. 1025.)

Oct. 2, 1883.-To this date (four days after the puncture) the patient had had no pain in the arm; a good deal of clear fluid had escaped from the site of the puncture.

On the following day the patient complained of headache, and his temperature rose to 102 F. Pulse 100. In the evening his temperature was 104 F. A good deal of purulent fluid escaped from the wound.

Oct. 6.-The temperature was at this date 102 F. There had been less discharge from the wound.

At about this time the patient first complained of pain in the shoulder, and I began to suspect the true nature of the swelling of the arm. But unless I had previously known that a synovial cyst in connection with the knee might appear in the middle of the calf of the leg, it is quite likely that even at this time the direct connection between the abscess and the shoulder-joint would not have been discovered. For, as before mentioned, the cyst or abscess was about half way between the shoulder and the elbow, and my attention had not been previously drawn to any affection of the former.

On questioning the patient, we found now that he had suffered from pain and stiffness about the shoulder-joint for many weeks, although the relation in time between the appearance of these symptoms and that of the cyst in the arm could not be clearly made out.

Oct. 13.-The discharge had now ceased, but there was in-creased pain in the shoulder-joint, and a slight grating was perceptible on rotating the head of the humerous.

Oct. 22.-At this date it is noted that there is again discharge from the wound in the arm, and that the patient suffers from pain in the shoulder-joint, especially in the evening. He gets up in the afternoon.

Nov. 5., The patient is now much better. The pain in the shoulder is less, and he can move the arm much better.

Nov. 11., There is now no pain in the shoulder. The patient can raise his arm. The wound still discharges.

Nov. 26., There is still discharge of pus from the wound, and there is occasionally a good deal of pain in the shoulder-joint, which of late has been swollen and tender.

Dec. 10., At this date the discharge from the arm had almost ceased, and there was little or no pain or swelling about the shoulder; but during the last few days the patient has suffered from pain in the head and sleeplessness. He has also frequently vomited. The temperature has varied from 99.8 to 101.6^{0}F.

Dec. 11., The patient was delirious this morning, and on the following day he became unconscious, taking no food, and passing his urine and faeces involuntarily.

On December 14 the patient was better, perspiring freely, and quite conscious; but no real improvement was maintained, and he died December 16.

(For the details of the preceding notes I am indebted to Mr. Aldous, surgical dresser.)

Post-mortem Examination., Nothing abnormal was discovered in the brain, or in the thoracic, or abdominal viscera.

The cartilage had disappeared from the head of the right humerus and from the glenoid cavity, and pus was found tracking from the joint for some distance backwards beneath the latissimus dorsi muscle.

I regret that by some accident no account has been given in the surgical registrar's notes of any careful dissection of the specimen; but there can be no doubt (there was none at the time) that synovial fluid had found its way from the shoulder-joint to the middle of the upper arm by tracking along the course of the long tendon of the biceps muscle.

Case II
Synovial Cyst in connection with the Shoulder-Joint, Puncture, Subsequent Suppuration, Amputation at the Shoulder-Joint, Recovery

In August 1884 I was asked by Dr. Fred. F. Andrews to see, in consultation with him, a patient (F. H. P.), aet. 54, with abscess and several sinuses in the upper arm and about the shoulder-joint. He had suffered from aching pains, apparently rheumatic, in the shoulder since November 1883, and in February 1884 there was a large prominent fluctuating swelling at the upper part of the chest, at about the level of the shoulder, but which did not seem to have any connection with the shoulder-joint (although at this time the latter was somewhat stiff and painful), but rather, from its position, to be connected with the anterior and upper part of the thorax. In June 1884 the swelling, which was very tense and fluctuated readily, was punctured, when there escaped a quantity of thick yellowish fluid like serum or synovia. At the time it was considered possible that the fluid, if not cystic, might have come from the thorax; there were no symptoms attracting attention to any definite connection with the shoulder-joint. Soon afterwards, however, suppuration occurred in and about the site of the original swelling, and the neighbourhood of the shoulder-joint. Various abscesses "formed," and were either punctured or burst spontaneously, one above the clavicle, and one or more in the upper arm.

The patient, notwithstanding the abscesses and the increasing stiffness of the shoulder-joint, was able to get about, and for a time to return to his business. Suppuration, however, never entirely ceased, and indications of disease of the shoulder-joint became more and more marked.

When I first saw the patient, he was in the condition just mentioned; able to get about, but with several sinuses leading for long distances beneath the skin and towards the shoulder-joint, with pus escaping rather profusely from some of them. The joint was stiff, but at this time no symptoms of acute disease were present.

Some few months afterwards, in December 1884, the symptoms, both general and local, became much more serious. There could be no doubt that the shoulder was undergoing a process of acute inflammation and disorganisation; abscesses were extending from it in various directions, with profuse discharge from sinuses above the clavicle and in front of the shoulder and in the upper arm. The patient's health was much broken; he had a red, glazed, and aphthous tongue, and a hectic temperature, and was fast losing flesh and strength.

I performed amputation at the shoulder-joint in Demember 1884; the patient afterwards making a rapid and complete recovery.

The specimen, which was kindly dissected for me by Mr. D'Arcy Power, curator of the Museum at St. Bartholomew's Hospital, is figured in the 36th volume of the Path. Soc. Trans., plate xii., p. 336. It shows the effects of acute inflammation of the head of the humerus, with ulceration and destruction of the cartilage. In connection with it are the remains of a cyst, which was probably in connection with the bursa beneath the subscapularis muscle.

Case III
Synovial Cyst in connection with the Elbow-Joint

A post-office porter (W. H.), aet. 32, was admitted into St. Bartholomew's Hospital, under my care, in August 1884, on account of a swelling in the neighbourhood of the left elbow-joint.

The swelling, which had an oval outline, was about the size of a hen's egg, and was situated immediately above the internal condyle.

The skin over it was quite normal, and was not adherent to the tumour. There was slight fulness on each side of the triceps tendon, just above the olecranon, as if from the presence of fluid in the elbow-joint. The movements at the elbow-joint were pain-less, but the forearm could not be quite completely flexed or extended. The swelling was not tender, but a little pain was produced by free movements at the joint.

The swelling was first noticed two years and a half ago, when it was about the size of a small nut. It grew slowly, but for the last three or four weeks has rather rapidly increased.

A few days after the patient[s] admission into the hospital, the swelling was tapped, when some brownish viscid synovial fluid containing granular matter escaped.

The tumour almost entirely disappeared after the tapping, but rapidly re-filled; and the patient left the hospital in almost exactly the same condition as on admission.

I have seen the patient at intervals of a few weeks to the present time (November, 1885).

But little alteration has occurred in the swelling, but gradually, under gentle pressure with a flannel bandage, the size has some-what diminished, and the patient has been able to do his work; the pain and tenderness gradually becoming less, and the movements of the arm less restricted.

Case IV
Synovial Cyst in connection with the Elbow-Joint

(For permission to publish this case I am indebted to Mr. Savory, and for the notes to his house-surgeon, Mr. Lawrence.)

A man (H. D.), aet. 40, was admitted into St. Bartholomew's Hospital, November 25, 1884, under the care of Mr. Savory, on account of a swelling in the arm. The swelling is situated on the inner side of the left elbow, about an inch above the internal condyle, being somewhat larger than a pigeon's egg, fixed to the deeper textures, but, like the skin over it, freely moveable. There is fluctuation. The arm cannot be extended beyond an angle of 120 , and cannot be completely flexed.

The swelling was first noticed in the beginning of May last, and increased so rapidly that the patient came to the hospital as an out-patient about a week afterwards. At that time the swelling extended in front from the internal to the external condyle; full extension being impossible.

An angular splint was applied, with lotio plumbi dressing.

After about six weeks the arm had so much improved that in July the patient recommenced work; but about a week before his admission he again suffered from pain and swelling and inability to fully extend the arm.

A few days after his admission into the hospital the tumour was punctured with a grooved needle, and about three drachms of thin glairy and curdy, apparently synovial, fluid escaped. A pad and bandage were applied and the arm placed in a sling.

As a result of the treatment the swelling almost disappeared; but in a few days it "re-formed," though it did not become so large or tense.

January 10, 1885., Another small incision into the tumour was made today, when some clear yellow glairy fluid escaped, with a small piece of what looked like thickened synovial (p. 186) membrane. A pad was applied; and a few days afterwards the patient left the hospital wearing a plaster of Paris bandage.

I have seen one other case very like the two which have been just recorded.

Case V
Synovial Cyst in connection with the Hip-Joint

(I am indebted to Mr. Thomas Smith for an opportunity of seeing on several occasions the patient to whom the following account belongs, which has been published by Mr. Stephen Paget in the 36th volume of the Trans. Path. Soc. of London, p. 342.)

"William B., house-decorator, aet. 34. Father rheumatic; him-self healthy, except for rheumatism. Four children, all very healthy; has lost none.

The history of his case is as follows:

In 1874 he began to feel pain in the left hip and knee.

In 1876 these pains interfered wi th his work. He was in St. George's Hospital for four months, and then in the Royal Free Hospital.

In 1877 he was in St. Bartholomew's Hospital under Mr. Thomas Smith. The left hip was immoveable; the left knee was stiff; there was slight fulness below Poupart's ligament; and the note taken at this time puts "deep-seated fluctuation (?)." He was treated by extension of the limb with a weight of 10 lbs., and was sent out on crutches.

In 1883 he was again admitted, having managed to get about and do his work for the last six years. The movement of the left knee was now much impaired, and of the left hip still more. There was pain only after exertion. The limb was everted and three-quarters of an inch shortened. The trochanter was thickened. The whole of Scarpa's triangle, from Poupart's ligament to the middle of the thigh, and inward as far as the edge of the adductor longus, was occupied by a large hemispherical cyst, fluctuating throughout, measuring 7'1/2inches vertically by 7 across. It was tapped, and 42 oz. of yellow alkaline fluid drawn off, of specific gravity 1028, containing much fat and cholesterine. Next month it was again tapped.

In 1884 it was again tapped, and 40 oz. of fluid, evidently synovial, were drawn off.

In 1885 (March) he can get about well enough to do his work, and can walk two miles. He has lately suffered from more pain. There are pain and creaking noises in both shoulders. He complains of pain at the back of the head and at the epigastrium. Pupils normal; patellar reflex normal. The cyst is filling again. The veins of the limb are varicose. There is no oedema of the scrotum, such as following the first tapping in 1883."

The following case of disease of the ankle-joint appears to be one of like nature to those previously recorded. But I do not remember seeing the case, and lighted upon it only by accident in the Hospital Records.

Case VI
Synovial Cyst over and below the External Malleolus

"E. B., aet. 13, was admitted into Darker Ward, March 22, 1879, under the care of Mr. Callender. No history of injury.

In the last three years patient has noticed a swelling in the neighbourhood of the left ankle-joint, which has varied in size, nearly disappearing after prolonged rest, and

getting much larger during exertion. It gives him no pain, but he states that the joint is weak, and inclined to yield under him.

24th.-At present there is a small, smooth, fluctuating swelling stretching along the anterior edge of the external malleolus, generally rounded in shape, and evidently containing fluid. The skin over it is natural, with the exception of having been discoloured by the application of some iodine. The top of the swelling slightly overlaps the surface of the malleolus, but does not extend either below its apex or under the anterior tendons. No alteration in size is noticed after short pressure upon it. The hollow behind the malleolus, between it and the tendo-Achillis, is not so well marked as it should be. The anterior tendons are rather more lifted up from their bed than those of the opposite side. There is no thickening of the bones round the joint, nor is there any pain on movement or pressure anywhere. Mobility (passive) of the joint appears, if anything, to be increased.

25th.-Trocar and cannula inserted into swelling, with the result of evacuating a clear, gelatinous, synovial fluid. April 4.-The swelling has again increased.

9.-Swelling tapped, and lead foil strapped over the part where the fluid had been evacuated.

29.-Swelling much smaller than formerly, but still it gives a sense of fluctuation.

May 23.-Swelling nearly gone.

Discharged.

Readmitted into Abernethy Ward under the care of Mr. Savory, January 1, 1880.

In the last five months he has been in Bow Infirmary, and unable to walk.

He cannot now bear his weight upon his left foot. The foot he keeps extended, and cannot flex it more than to a right angle. The leg and thigh have wasted, and are conspicuously smaller than the right. There is uniform swelling round the ankle-joint. It is soft and tender on pressure.

The surface of the joint is hot, and when the foot is moved or the heel pressed upwards he complains of pain.

Back splint, swing cradle, lotio plumbi.

Jan 8.Ol. morrhuae, syr. feri phos. i. ter s. 18. Less tenderness.

26. Gum and chalk bandage.

Discharged.

I have seen a case some few years since of an apparently bursal multilocular cyst on the back of the fore-arm and carpus, which I have no doubt was identical in its pathology with that of the synovial cysts here described. Unfortunately I cannot find any written notes of the case. The patient was a man about 30 to 40 years of age, a butcher from Smithfield Market, who attended as an out-patient for many months on account of a large

fluctuating irregular swelling on the back on the hand and extending up the fore-arm for some little distance; the swelling being deep-seated and involving the region of the sheaths of the tendons, but with-out any indications of being produced by a regular thecal distension. On the contrary, the swelling was irregular in outline, as if more or less multilocular, with a general thickening of all the tissues in the neighbourhood of the wrist-joint, and I believe (although I cannot now speak positively on this point) with restricted movement of the latter.

With the help of elastic support to the wrist the patient was able to continue his work; and although the question of operation was often considered, I never felt justified in recommending any. After many months I lost sight of the case; but the last memory I have of it is distinctly that of a more or less thickened and crippled wrist-joint, and not that of thecal disease only.

In the *British Medical Journal, vol. ii.* 1884, p. 413, Mr. Arthur T. Norton describes cases of what he terms "gangliar disease of joints," which seem to me identical with the case just described and which, like it, are probably identical in thier pathology with many of the cases which I have related in connection with other joints.

"In one case a woman, aet. 40, fancied she had sprained her wrist five years ago, but did not recollect the occasion. For four years there had been some swelling and pain, but she had not been prevented from continuing her employment as a domestic servant. For the last three months before admission to the hospital there was a so-called ganglion about four inches in length, extending upwards from the wrist-joint in the centre of the fore-arm. The ligaments of the wrist-joint were sufficiently loose to allow lateral gliding movement. The annular ligament was pushed forward by ganglionic enlargement, and there was evidently fluid within the wrist-joint. The hand hung down, and there was no power to raise it. The hand was quite useless, and the disease was increasing and had continued so to do for more than five years, regardless of treatment."

From a past experience of similar cases Mr. Norton concluded that the only treatment was amputation, which he accordingly performed. On examination of the hand after removal, he found the ganglion already mentioned filled with the usual jelly-like material, which on pressure separated into plates or melon-seed shapes. This ganglion extended into the wrist-joint. The wrist-joint contained a small quantity of fluid; the synovial membrane was villous; the ligaments were distended and allowed lateral gliding movement of the joint; and all the bones of the carpus were rarefied or softened, so that a pin or a knife could be easily pushed through their substance. Though there was no caries, the articular cartilages were thinned.

Mr. Norton relates other similar cases.

From the foregoing cases the following conclusions may be drawn:-

That abnormal synovial cysts may be formed in connection, not only with the knee, but in connection with the shoulder, the elbow, the wrist, the hip, and the ankle joints.

That the manner of formation of these synovial cysts probably resembles that which has been proved to occur in connection with the knee-joint, namely, that the synovial fluid on reaching a certain amount of tension by accumulation within the joint, finds its

way out in the direction of least resistance, either by the channel by which some normal bursa communicates with the joint, or, in the absence of any such channel, by forming first a hernia of the synovial membrane. In both cases, should the tension continue or increase, the fluid at length escapes from the sac, and its boundaries are then formed only by the muscles and other tissues between and amongst which it accumulates.

That in the case of the shoulder-joint the abnormal synovial cyst may be found either in front a little below the clavicle, or in the upper arm in the region of the biceps muscle.

That in connection with the elbow-joint the cyst is usually placed on the inner side, a little above the internal condyle of the humerus.

That in the case of the wrist-joint the synovial cyst may be either in front or behind.

In the only case in connection with the hip of which a note has been preserved, the swelling was in the upper part of Scarpa's triangle.

In the one case in connection with the ankle-joint the synovial cyst was in front and to the outer side.

That the apparent want of direct communication between the joint and the abnormal synovial cyst is frequently deceptive, and should not lead to the inference that no such communication exists.

That the caution given in the previous communication, not to interfere by operation with these synovial sacs without good reason, has been justified by increased experience.

Hitherto I have not discovered any relationship between the form of osteo-arthritis with which some of these synovial cysts are associated and locomotor ataxy, but I suspect that in some of them a relationship will be found to exist.

Trans. Path. Soc. of London, Vol. xxvi, 1885.

EXPERIENCE WITH EARLY OPERATIVE INTERFERENCE IN CASES OF DISEASE OF THE VERMIFORM APPENDIX

Charles McBurney, M.D.

Charles McBurney (1845-1913) was an American surgeon and pioneer in the diagnosis and operative treatment of appendicitis. He presented his findings in 1889 before the New York Surgical Society. His paper follows here as published by the *New York Medical Journal*, 50, pp. 676-684, in 1889. (White 2009)

I venture to introduce once more a subject that has been so ably treated by numerous writers, because I have for some time been devoting my attention in suitable cases to a particular line of treatment, and because I have been fortunate enough to have had recently a considerable number of cases of disease of the appendix under my care. Nearly two years ago the account of a case of successful laparotomy for perforation of the vermiform appendix was read before this society by our much-lamented colleague, Dr. Henry B. Sands. The case was a most brilliant one through-out, and illustrated particularly well the cleverness of diagnosis and the rapidity of successful action which we all remember as so characteristic of the reader of that paper. It should not be forgot-ten that at that time such action was a very bold step into ground that was almost unknown. We did not all agree with Dr. Sands in the views which he expressed in regard to the pathology of perityphlitis, but these views did not prevent him, when the proper case occurred, from making, in regard to treatment, a brilliant stride in advance of others. This case gave an impulse to the study of inflammatory affections of the vermiform appendix from which we shall not recover for a long time. During the following months Dr. Sands devoted much attention to this study, and it was my privilege to assist him in a number of successful operations for the removal of the appendix at an early stage of disease. It seemed to me that each one of these operations shed a flood of light upon the pathology of the so-called pericecal inflammations, and during the summer following, while discussing the subject, he expressed to me views which were far in advance of most surgeons and very different from those which he entertained at the time when he wrote his last paper. If he were here to-night he would, by the results of his own last year's original work, enlighten us upon many points respecting the pathology of perityphlitis. I feel it a pleasure and a duty to thus refer to Dr. Sands, because, unfortunately, no special record has been kept of his last

year's brilliant work, and his sudden death prevented him from telling us himself what would have been so valuable. Certainly no other surgeon ever did so much to improve the treatment of a very fatal disease. Beginning with the first suggestion of Dr. Willard Parker, which taught surgeons how to save many lives, although by a slow and often unsatisfactory process, Dr. Sands ended his work in this direction by showing us how we might cut short at its very inception a disease that is even to-day responsible for many deaths.

It is not my intention in this paper to attempt to present the subject of pericecal inflammation in a systematic manner. That has already been done, and very recently, by a large number of writers. I have chosen rather to dwell upon some points in the pathology and treatment of these inflammations, which are be-ginning to be better understood and which especially interest us all. The fact that inflammatory affections of the vermiform appendix give rise to a considerable number of the so-called pericecal inflammations is now accepted in every part of the medical and surgical world, although one still reads of perityphlitis and paratyphlitis, and of intraperitoneal and extraperitoneal abscess-es. Certainly all of these terms are misleading, inasmuch as each of them, when used without explanation, implies that the particular disease to which it refers is a disease by itself, and fundamentally different from the others. The usual term perityphlitis means, strictly speaking, nothing more than an inflammation of the peritoneum surrounding the cecum, but it is understood by many to mean often a localized and harmless peritonitis arising from impaction of feces, by others a fatal septic disease originating in perforation of the appendix. Now it is unquestionably true that every cause of inflammation of the appendix is sooner or later accompanied by inflammation of the neighboring peritoneum, either on the cecum or mesentery or ileum, etc., but if from the whole list of acute inflammatory affections occurring in the right iliac fossa we set aside those originating in the appendix, how many shall we have left? Very rarely will occur a perforation of the cecum by ulcer or foreign body, giving rise to a local peritonitis at this point, and traumatisms from without may accomplish the same result. For all of such causes as compared with inflammations of the appendix, let me hazard the proportion one in one hundred.

How many cases of localized peritonitis or perityphlitis arise from impaction of feces in the cecum? Some writers would lead us to believe that this is a frequent cause, and not long ago it was looked upon as the *most* frequent cause. Is there *a single* observation brought from the dead-house or from the operating-table to support this idea? I have never heard or read of such observation, and I do not believe that any such case ever occurred. Clinically we meet with cases of pain in the right iliac fossa, accompanied by some rise of temperature, and not infrequently in these cases we may detect masses of feces in the cecum, but no peritonitis exists, and it is no more likely to arise from this cause than from ordinary constipation, which often causes pain and rise of temperature. Correctly speaking, then, peritonitis localized in the immediate ¨neighborhood of the cecum and characterized by the well-known symptoms may, with the rare exceptions referred to, be attributed to an inflammation of the vermiform appendix in some one of its numerous stages. This inflammation may be a comparatively mild catarrhal one,

affecting little more than the mucous membrane, or it may have rapidly passed through various stages to complete gangrene of the organ. I must therefore prefer to use the term inflammation of the appendix, or appendicitis, and give up, once and for all, the terms perityphlitis, paratyphlitis, extraperitoneal abscess, etc., as misleading and not valuable except in explanation of secondary pathological processes. In regard to the so-called extraperitoneal abscess as a result of inflammation of the appendix, there remains nothing to be said to any one who has read Dr. Wier's admirable paper in the "Medical News" for April 27th of this year. The statements and observations which Dr. Wier there makes are perfectly convincing, and I have often confirmed many of them during an operation. As a late result of a much-neglected case, pus may force its way through the lateral or posterior peritoneal lining of the abdomen, but even in very old cases this must be a rare condition, and I have myself never met with such a one. All of these abscesses originating in inflammation of the appendix are intraperitoneal. Inflammatory adhesions, which glue together the adjacent coils of intestine, prevent the contents of the abscess from flowing into the pelvis or among the intestinal folds. At every point the pus is bounded by peritoneum. All of the operations done by the Willard Parker method require section of the peritoneum which forms the anterior wall of the abscess. I have dwelt upon this point because it is a very important one, and one's views in regard to it will determine his operative methods. In this connection I must refer to two other termsextraperitoneal abscess and extraperitoneal incision for the opening of such abscesses. These again are very misleading, and imply that uninflamed peritoneum can be pushed away from the iliac fossa, the connective tissue broken through, and the abscess evacuated. If these abscesses are, as I have stated, *all* (with possibly a very rare exception) intraperitoneal, then, of course, these terms are false and misleading. The peritoneum may be pushed back and the abscess incised deep in the iliac fossa by a roundabout and unsurgical method, but when incised the peritoneum will be cut. In the present state of surgical opinion, it remains with those who claim that they meet with extraperitoneal abscesses and make extraperitoneal explorations to prove their point. In not a single one of the early operations for appendicitis which I have done and seen done has there been the slightest doubt as to the fact that the incipient abscess was entirely within the peritoneal cavity. I mean that this fact has always been demonstrable to the satisfaction of every one present. This one must consider as a valuable piece of evidence, for the observations were made at a period in the disease when there could be no obscurity as to the actual condition present. Wier has clearly shown also, in the paper already referred to, by carefully analyzing the reports of one hundred autopsies, that in no one of them did the abscess originate in the extraperitoneal tissue, and that in only four was pus found there at all. Weir also states, when referring to the difficulty of demonstrating the intraperitoneal origin of these abscesses after a considerable abscess has formed, that in only eight out of twenty-six abscesses opened by him could he "recognize that the inner wall of the abscess was made up of loops of intestine bound together by adhesions." But, as I have already said, *no difficulty* is found in making this demonstration when an operation is done at an early stage of the disease.

In these early operations I have found a very varied condition of the appendix and its surroundings, from a mild catarrhal condition of the mucous membrane accompanied by some infiltration and thickening of the submucous and other tissues, to the state of complete gangrene of the whole organ, with more or less extensive peritonitis.

In one instance I removed the appendix from a young lady who in the course of little over a year had had no less than twelve attacks of so-called perityphlitis. These attacks had been severe, giving rise to great pain with rise of temperature, and causing alarm not only to the members of her family, but to her medical attendants, two of these at least being as careful observers as exist in New York. The operation was done during a period of complete health and after careful consultation, to prevent recurrence. The appendix was found rigid and swollen, the mucous membrane mildly inflamed, the other tissues of its walls greatly thickened. Not the slightest evidence of peritoneal inflammation or adhesion existed. The appendix was readily removed and the patient made a rapid recovery. The operation was done nine months ago. Since that time the patient has enjoyed unbroken health, has resumed active exercise, and has gained twenty pounds in weight. In another case, also a young lady, attacks of abdominal pain, accompanied by vomiting, exquisite tenderness in the right iliac fossa, and considerable elevations of temperature, had occurred on four different occasions. This patient had also been taken care of by the most competent men. Curiously enough, just at the time of this patient's last attack her sister died without operation from a violent purulent peritonitis caused by perforation of the appendix. Subsequently to this last attack and during a period of complete health I removed the appendix after careful consultation with her physician, Dr. J. W. McLane, to prevent recurrence. A condition of disease somewhat in advance of the case already narrated existed. The appendix was quite firmly bound by old adhesions to the under surface of the intestinal mesentery and to the cecum. The mesentery of the appendix had been nearly obliterated; the organ itself was dark-colored, considerably swollen, but soft. The mucous membrane was very dark-colored and swollen, and inclosed some fine fecal grains. Two partial strictures of caliber existed which produced retention of a dirty brown fluid. The evidences of former limited peritonitis existed on the neighboring portion of the cecum. This patient also made a rapid recovery, being out of bed at the end of two weeks, with a wound completely healed. The operation was done over four months ago, and the patient had remained in perfect health, having gained largely in weight and having resumed active exercise from which she had been entirely de-barred. These two cases are quoted at this point to show that comparatively slight conditions of inflammatory disease in the appendix may give rise to threatening illness, which by some would be described as resolving perityphlitis without further explanation. There can be little doubt that both of these cases were preparing for abscess or general peritonitis.

In other cases, all in an acute stage of inflammation and which will be quoted later, the conditions found have been these: In one the appendix formed a considerable cyst containing nearly an ounce of dark-brown pus. No communication with the cecum existed.

In several the appendix was swollen, discolored, diseased throughout, but gangrenous only at one or two points where perforation had occurred, and in these cases one or more fecal concretions existed, either within or just outside of the appendix.

In several the appendix was in general only moderately diseased, but perforation had occurred, and quite firm recent adhesions had tied the appendix to some adjacent part, doubling it upon itself and so inclosing a small collection of pus with or without concretion.

In two cases the appendix was thick, but flattened so as to be with difficulty recognized, and very firmly bound to the under side of the cecum, and in two cases the appendix was completely gangrenous. In all of these acute cases peritonitis existed, usually a plastic peritonitis of greater or less extent, always involving the cecum and generally the adjacent intestinal coils and abdominal walls. In one case the omentum was quite extensively involved, partly enveloping the appendix. In *no* case was the appendix more than lightly attached by adhesion to the peritoneum covering the iliac muscles, and in none was *extra* peritoneal inflammation observed, excepting sometimes in the anterior abdominal wall. In most cases some pus was found more or less confined by adhesions within a limited area, and in one absolutely no adhesion of any kind existed, though the appendix was perforated by concretion, and very foul pus filled the pelvis and ran freely upward beside the colon.

The pathological conditions of the appendix, as compared with the symptoms in my own cases, most positively show that one can not with accuracy determine from the symptoms the extent and severity of the disease. I therefore doubt the safety of the advice given by several recent writers, to watch the symptoms and to be guided by their violence in determining the method of treatment. This will appear more clearly in the histories of the cases. I should like now to refer to some of the special symptoms *the weight and value of which have been subsequently determined by an immediate operation,* for it is in this manner that we shall mostly advance our knowledge of the pathology of appendicitis. By autopsy we can not learn very much more in this direction if one may judge by the length of time it required to learn the important single fact that abscesses originating in the appendix are almost invariably intraperitoneal. Pain to a greater or less extent is present in all cases of appendicitis, but many a mistake has been made and a golden opportunity lost by looking for pain in the iliac fossa and an *absence* of pain in other parts of the abdomen. General abdominal pain is often all that the patient will complain of in the first few hours of his attack, and in many cases it requires a careful and pointed examination to determine that the cause of the pain is situated in the iliac fossa. But after the first few hours it becomes more and more evident that the chief seat of pain is at that point, and the general pain then usually subsides. The epigastric region is frequently the point first complained of. One patient, who died on the third day from violent septic peritonitis from perforation, complained of comparatively little pain even when the iliac fossa was firmly compressed. The *exact* locality of the greatest sensitiveness of pressure has seemed to me to be usually one of importance. Whatever may be the position of the healthy appendix as found in the dead-house and I

am well aware that its position when uninflamed varies greatly have found in all of my operations that it lay, whether thickened, shortened, or adherent, very close to its point of attachment to the cecum. This, of course, must, in early stages of the disease, determine the seat of greatest pain *on pressure.* And I believe that in every case the seat of greatest pain, *determined by the pressure of one finger,* has been very exactly between an inch and a half and two inches from the anterior spinous process of the ilium on a straight line drawn from that process to the umbilicus. This may appear to be an affectation of accuracy, but, so far as my experience goes, the observation is correct.*

Chill and vomiting are frequent, but so often absent as to be in no sense of much diagnostic value. Fever to some extent is present in all cases, but very different in degree, some severe cases having a temperature on the first day of less than 100.5 , others rapidly reaching a temperature of 103.5. But, as nearly excluding non-inflammatory pains, the presence of this symptom is certainly of importance. Rigidity in the abdominal muscles, generally much more marked on the affected side than on the other, I have found very constant, and I believe it to be a sign of value.

Abdominal distension by tympanites varies greatly, and its degree by no means measures the severity of the diseased process. It may be very decided during the very first hours of a mild case, and also entirely absent in the worst form of sudden perforation. It must, of course, be influenced greatly by the condition of the patient's bowels, the ease with which the intestine in each individual is brought to a state of paresis, and by many other causes. But when the gut has been found during the operation to be overdistended, the portion of gut so affected has always been the large intestine. Probably pareses from the local peritonitis is here a large factor.

Tumor of greater or less size I have usually been able to detect at a very early stage, but the composition of this tumor, as shown during operation, has varied greatly. In one case the tumor consisted of the distended unruptured appendix, which was partly wrapped in an inflamed and thickened omentum. In another it was formed of a mass of intestinal coils swollen and glued together by recent plastic exudation. This tumor was large, quite firm, and gave one the impression that a large quantity of pus was present; but only a very minute abscess was found, and that was situated quite beneath the cecum. But under ether some tumor can invariably be detected; and this agent will, I think, be found to be a valuable help to diagnosis in some doubtful cases. The tumor may be dull on percussion, as when pus has formed and lies against the anterior abdominal wall; but I have more than once found a small deep tumor containing pus, which was so completely covered in front by intestines that the percussion note, before ether was given, was purely tympanitic. The pulse during the onset of appendicitis is usually rapid and irritable. The patient prefers to have the right thigh elevated, and objects to its overextension. Rectal examination at the onset I have not found of any value.

The combination of symptoms present will usually render a correct diagnosis as to the seat of the disease quite easy, but in reference to the stage which the disease has reached, that is, whether pus has formed or not, whether the appendix is already perforated or not, even sometimes whether already general septic peritonitis exists

or not, the diagnosis is often very doubtful. I remember one case where Dr. Sands performed a beautiful operation and saved the patient's life. At the consultation held before operation four gentlemen were present. Three of them had certainly seen many cases of appendicitis. Three quite different opinions were expressed. Dr. Sands thought that the appendix was perforated, and that pus had formed. One of the others thought that there was probably appendicitis, but advised an extraperitoneal incision. Another thought the case so mild that it should be treated without operation. Dr. Sands operated by an incision along the right edge of the rectus muscle, opened an intraperitoneal abscess just in the middle of his incision, and removed a perforated and sloughing appendix. The patient rapidly recovered. This case occurred very shortly after Dr. Sands read his last paper before this society. I mention it to show that the diagnosis of the exact condition in such cases is not easy. A means of diagnosis lauded by some, permitted by others, and totally condemned by a few, is the exploring needle. I believe that the use of this instrument will become less and less frequent as we know more of the disease. While perhaps occasionally permissible at a late stage of the disease, it is certainly to be condemned at its beginning. The discovery of pus with the syringe is, to be sure, gratifying to a hesitating operator, but the withdrawal of an infected needle through several layers of peritoneum, which it may have passed during its introduction, can totally nullify a good subsequent operation. And, if the needle does *not* discover pus, which has often happened even when that fluid has been present in considerable quantity, then the man who pinned his faith on a needle is induced to underestimate the importance of the case and its mode of treatment.

Some years ago I went a long distance into the country pre-pared to operate upon a nine-days-old abscess, the result of appendicitis. There existed a large fluctuating tumor, and the case was plain and needed just one cut. But the family physician was very conservative, and said the time had not come, and that there was no pus. I was in despair, for the journey took many hours. Fortunately, I had a good hypodermic syringe with me. The doctor said rather superciliously that that thing was harmless anywhere. So he permitted its introduction; and when the barrel filled with pus he yielded to an operation, and treated me after-ward with great respect. But to search for pus with a needle, first in one direction and then in another, at the risk of doing harm, and with no certainty of acquiring any real information, is a practice as unsurgical as it is unnecessary.

I think that there is still much misapprehension in the minds of many practitioners as to the symptoms produced by perforation of the appendix. Many associate with this condition, and with no other, a very violent onset of the disease with quite well-marked symptoms, as compared with the less severe commencement of a slowly forming abscess. The truth is that, in the early stage, no accurate diagnosis can be made as to whether the appendix is perforated or not, excepting in those cases where comparatively mild symptoms *suddenly* become much aggravated, when perforation or the rupture of an abscess may be inferred. Perforation often occurs with but few symptoms at the very beginning of the disease, but, being preceded by the formation of more or less plastic adhesion of the appendix, no sudden increase in the severity of the disease occurs at

all. An abscess slowly forms, which may increase to a considerable size without being discovered, and then force its way, or proceed by infection, in the most dangerous directions. The comment might fairly be made upon this description of the early symptoms of appendicitis that the diagnosis of the disease is very obscure and uncertain. To the careful observer it is not difficult, however, to determine as to the existence of the disease. The only real difficulty lies in determining within the first few hours what the future progress of the disease is to be in deciding whether firm adhesions are forming, which will effectually exclude pus from the general peritoneal cavity, and so pro-vide for subsequent safe evacuation of abscess, or whether no such protecting wall exists, and an overdistended appendix threatens to instantly set up a fatal peritonitis. If this difficulty could be set aside by a more careful study of symptoms, and without losing valuable time, our course would be clear, and we should no longer helplessly hesitate as to when to operate and when to stand aside. There is no reason to think, however, that diagnosis from symptoms alone will ever reach that perfection. We need some further aid to diagnosis; some positive and rapid means of determining what method of treatment we are to adopt. We have reached a point where we can never be satisfied with the mortality that attends an expectant treatment. What we wish to accomplish in the treatment of appendicitis is, not to save half of our cases, not four cases out of five, but *all of them;* and how is this end to be attained except by improved methods of diagnosis at the very earliest stage of the disease? I hope that I may never again go every day to visit a threatening case, waiting bashfully for the authority of a clearly defined general peritonitis before I dare take action. I do not mean to deny that many very ugly-looking cases of appendicitis go on to the formation of abscess which may be safely opened and end in complete recovery; we have all of us seen many such. I am well aware that numerous cases have presented all the symptoms of the disease, have become very ill, and have finally recovered without any operation. Within two years I have seen two cases, in one of which the patient was so ill that I refused to operate, and in the other case I strongly urged ,operation and was refused permission. Both of these patients recovered after long illness without operation of any kind. Probably the abscesses emptied themselves at some point into the intestine. But such unexpected recoveries, and the frequent formation of abscesses which can be opened safely at a later stage, even the many cases which quite rapidly terminate, at least temporarily, without suppuration, do not console us for the heavy mortality caused by appendicitis. What this mortality has been we shall of course never know. We do know that the cases which are recognized and which die are numerous, and it is safe to assert that a very large number of fatal cases of peritonitis commence with an unrecognized inflammation of the vermiform appendix. No one will dispute that if we could so improve our methods of diagnosis that we could recognize within the first few hours the serious nature of many cases, we would operate in these cases at once, willingly preferring to incur the risks of an operation rather than face the certainty of death that septic peritonitis implies. How may we improve our methods of diagnosis? At present I see no clearer road than the exploratory incision permitting a direct inspection of the parts and a complete

study of the disease. If it can be shown by future experience with improved methods of operation, and with more perfect antiseptic precautions, that the exploratory incision for the inspection of the diseased appendix is much more free from danger than the expectant treatment, then there could be but one answer to the question, What is the best treatment? The firm conviction that very early operation for the cure of appendicitis can, with proper care, be done with very slight risk, has induced me to subject a considerable number of these cases to the earliest operation possible, and my chief purpose to-night is to present to you the results of my work in this direction. It is proper to state that no case of appendicitis has been refused operation, and that all the cases operated upon in the early state of the disease are here reported:

Case I.

E. M. P., a young gentleman nineteen years of age, complained of general abdominal pain at 11 A.M. on May 2I, 1888. The pain was regarded as due to indigestion, and was treated with family remedies. In the afternoon the patient fainted, and by four o'clock his pain had greatly increased in severity. He received a little morphine and hot applications were applied. At 5 P.M. his mouth temperature was 98.4 , his pulse 100. During the night and the following day the patient complained sometimes of severe pain, and occasionally felt much better; he took a considerable quantity of milk, and at 8 P.M. his temperature was only 100. During the second night he suffered much pain, and at 5 A.M. on the 23d it was noted that his pain was chiefly in the right iliac fossa. At 5.30 he had a severe chill and his temperature rose to 103 , his pulse to 120. At this time he was visited by his physicians, Dr. Fessenden N. Otis and Dr. William K. Otis, who diagnosticated at once acute appendicitis, and requested me to see the patient. This I did at about 8.30. I found the pulse and temperature as stated, and the following condition: Great rigidity of right abdominal muscles; exquisite tenderness on pressure at a point just two inches internal to the anterior spine of the ilium, in the direction of the umbilicus. Beneath the finger at this point could be felt a small resisting mass, less than one inch in diameter. No dullness on percussion anywhere. General appearance excel-lent. The diagnosis of appendicitis already made by Dr. Otis was confirmed by myself, and an hour later by Dr. Sands. Immediate operation advised and accepted.

General appearance of patient excellent. It should be noted that at 11.30 the temperature had fallen to 101.

Operation at 12 o'clock, just forty-nine hours from the first pain. Present, Dr. F. N. Otis, Dr. William K. Otis, Dr. L. R. Morris, and Dr. Tuttle.

Ether anesthesia. A slightly oblique incision four inches and a half long, the center of this incision being two inches from the anterior iliac spine toward the umbilicus. Tissues of abdominal wall quite markedly edematous, particularly near the peritoneum. On opening the peritoneum freely, the appendix came at once into view. It was larger than a man's thumb, dark-brown in color, tense, evidently full of fluid, and at no point gangrenous, but its wall evidently nearly as thin as paper. A tail of omentum partly

enveloped it, and this was much inflamed and freshly adherent. Everywhere else the peritoneum was healthy, and not an indication of the formation of any bounding wall of adhesions existed. Coils of small intestine surrounded this full-to-bursting sac. The omentum was gently separated and the inflamed portion ligated and cut away. The mesentery of the appendix was carefully tied in sections, and the base of the appendix dislodged from an inverted pouch of cecum, ligated at its base, and cut away. It proved to contain at least half an ounce of very foul brown pus, but no concretion. Its communication with the cecum was closed by stricture, so that the unbroken, purulent, acutely inflamed cyst was removed entire. The stump was disinfected with a 1-to-1000 bichloride solution. Two silver-wire sutures passing through the whole thickness of the abdominal walls closed the upper part of the wound, and one similar suture the lower part. The central portion was loosely packed with iodoform gauze down to the ligated stump. Dressing of iodoform and bichloride gauze over all.

At 6.40 P.m., less than six hours after the operation, patient's temperature was 99.8 and pulse 80. A small quantity of morphine was given for wound pain. The dressings were changed on the third day, and a perfectly aseptic condition of wound found. This patient made a rapid and absolutely unbroken recovery, and is today perfectly well.

This is, I believe, the first recorded case where an acutely inflamed unruptured appendix has been removed full of pus. Who can doubt what the result would have been in this particular case had the cyst ruptured, and the operation been delayed a few hours? Would not the opportunity for recovery have been lost had the advice so often and so recently given been followed, to delay operation until symptoms of spreading peritonitis appeared?

Case II

John S., ten years of age, was admitted to my care at the Roosevelt Hospital on August 19, 1889. He gave no history of previous attacks. A week ago he became ill, and complained of general abdominal pain. He went to bed, and says that since that time he has been feverish and has not been free from pain. Four days ago the chief seat of pain is said to have been in the right side and low down. On admission his pulse was 110, his temperature 103.4 , and he was nauseated. Between the umbilicus and the right iliac spine was noted a considerable tumor, which was markedly tender on pressure. The percussion note over the tumor was dull. No tympanites existed. The general appearance of the patient was that of severe illness. I operated on the same day. The usual incision was made, and the tissues found in a normal condition down to the peritoneum. The anterior peritoneum itself was perfectly uninflamed, and uninflamed small intestine covered the anterior face of the tumor. When these were drawn toward the median line, a mass of adherent intestines were disclosed, which inclosed a small indurated tumor.

The intestinal coils were gently separated on the anterior face of the tumor, and several drachms of fecal pus at once escaped, emptying a cavity somewhat tubular in shape and large enough to admit the finger. The appendix lay in this cavity, congested,

much swollen, and infiltrated with pus. No perforation existed, and no concretions were found. The appendix was tied off with silk and removed. A rubber drain was introduced, the cavity packed with iodoform gauze beside the drain, and a full antiseptic dressing applied.

On the following day, August 20th, the boy's temperature was 99.6 as against 103.4 the day before, a reduction in less than twenty-four hours of nearly four degrees. This patient recovered rapidly and completely, and on September 25th his wound was entirely healed.

Case III

W. K., a male, sixteen years of age, was admitted to my care at the Roosevelt Hospital on July 26, 1889. Previous history negative. Forty-eight hours before admission first felt pain in the right iliac fossa. On the next day diarrhea set in; abdominal pain was quite general, though more distinctly localized in the right iliac fossa than elsewhere, and this increased up to the time of admission to the hospital. The patient's temperature was then 102 , his pulse 110. The abdomen was slightly distended and tympanitic.

In the right iliac fossa was found a small, very tender non-fluctuating tumor, which lay just inside of the anterior iliac spine. Diagnosis, acute appendicitis.

Operation at 3.30, July 26th. The usual incision was made. Beneath the incision were found normal non-inflamed intestines. These were drawn toward the median line, when the appendix was found projecting stiffly forward and slightly upward by the inner side of the caput coli.

It curled around the end of the cecum and then turned upward and forward. Slight recent adhesions tied the appendix at its base only to the cecum. At other points it floated freely among non-inflamed intestines. The adhesions were broken down and the appendix ligated at its base and removed. It was six inches and a quarter long, edematous, and much thickened and inflamed throughout. Minute foci of pus were scattered through its.substance, but there was no concretion and no perforation. On its removal the seat of operation was left perfectly clean, but, to insure safety, a rubber drain was passed through the loin directly to the base of the stump, and the anterior wound was partly closed and partly packed with iodoform gauze. The next day patient's temperature was 100. His wound was inspected, but not dressed completely until July 30th. No pus was found. The patient made an unbroken recovery without incident, and his wounds were completely healed on August 19th.

Case IV

Annie O., eighteen years of age, was admitted to the medical wards of the Roosevelt Hospital on May 29, 1888. Six years ago she had an attack similar to the present one from which she entirely recovered without operation. Two days ago she was seized with severe epigastric pain accompanied by fever and headache, and tenderness on pressure

in the right iliac fossa. On admission, the abdomen was tense, tympanitic, tender on pressure at all points, but more especially in the right iliac fossa. Here a small tumor is distinctly felt. I saw this patient for the first time on May 30th, and, having expressed the opinion that she should be operated upon at once, she was transferred to my care. At this time her symptoms had become much more threatening; abdominal distension was extreme. Her temperature was low, 100.4 , pulse 100, respiration 36. I operated at once, making the usual incision. The tissues of the abdominal wall were edematous and the deeper ones much fused together. Beneath the center of the incision the distal end of the appendix was readily found. It was much enlarged and thickened, and greatly discolored. At first no pus was seen, but, on gently separating the end of the appendix from adjacent parts, a small cavity was found beneath it containing less than one ounce of pus. The cavity was cleaned with hot water, and it was then seen that the appendix was perforated at about its middle and lying in the perforation was a large fecal concretion. The whole appendix was then removed after ligating the base, the cavity was swabbed out with 1-to 1,000 bichloride solution, two rubber drains introduced, and the cavity packed with iodoform gauze. A complete antiseptic dressing was applied. On June 1st the patient's temperature was 99, pulse 100, respiration 18. Abdomen free from pain or distension.

This patient made an unbroken recovery, being out of bed on June 23rd, with a small, superficial, flat ulcer still to heal.

Case V

Charles E. A., twenty-five years of age, was admitted to the Roosevelt Hospital on September 1, 1889. Patient gives a history of probable appendicitis occuring five months ago.

Two days ago, after several weeks of abdominal discomfort, the patient was seized with severe abdominal pain, nausea, vomiting, and fever.

On admission, his temperature was 102. Internal to the anterior iliac spine, on the right side, some resistance and tenderness on pressure were noted. Diagnosis, appendicitis.

On September 2d, under ether narcosis, the usual incision was made, the tissues of the abdominal wall being found very edematous. Marked adhesions and thickening of the peritoneum were found over a large area, indicating clearly the existence at some previous time of a quite extensive peritonitis. This probably occurred during the attack referred to above. The appendix was found, after some difficulty, hanging over the edge of the pelvis, greatly thickened and hardened. After being freed from adhesions, it was ligated close to its base and removed. The immediate neighborhood of the stump was cleansed and the space packed with iodoform gauze. The upper portion of the abdominal wound was closed by suture. With the exception that a slight superficial abscess developed beneath the suture line, this patient made an easy recovery, and was discharged, with a wound completely healed, on October 17th. This patient was operated upon by Dr. Frank Hartley, my first assistant at the hospital.

Case VI

Miss E. C., twenty-five years of age, a patient of Dr. W. T. Alexander, of this city, had complained of a sense of uneasiness and discomfort in the right abdominal region, low down, for two or three weeks. She had, however, gone about as usual, and walked several miles daily. On June 18, 1889, in the evening, she was seized with severe general abdominal pain, most severe in the epigastrium, and was nauseated. She went to bed, and was then first seen by Dr. Alexander, who diagnosticated appendicitis, and ordered hot applications and a little morphine, with complete rest in bed. On the following day Dr. Alexander asked me to visit the patient. This I did in the afternoon. The patient's temperature was then 101 , and her pulse 100. She had a very ill look, and complained bitterly of the slightest pressure over the right iliac fossa and of some tenderness all over the abdomen. I advised immediate operation. There were present at the operation Dr. W. T. Alexander, Dr. G. T. Jackson, and Dr. R. P. O'Neill, and these gentlemen assisted me.

I made the usual incision. The tissues of the abdominal wall were normal, and within the peritoneal cavity scarcely the slightest trace of adhesions was found. The appendix, nearly completely gangrenous, as large as one's middle finger, lay just outside of the caput coli, not perforated, but containing two large fecal concretions, just ready to escape through very soft gangrenous tissue. A little purulent fibrin lay beneath the appendix. No limiting wall of any kind existed, and reddened small intestine lay above and below. The mesentery of the appendix was carefully and with some difficulty tied off, the appendix ligated at its base and removed. The immediate neighborhood was then thoroughly cleansed with 1-to-1,000 bichloride solution, dusted with iodoform, and packed with gauze. A rubber drainage tube was introduced beside the gauze down to the stump. The upper part of the incision was closed with two sutures. The patient suffered from nausea and tympanites for two or three days, when her temperature fell to normal and remained so. On the seventh day the wound discharges were decidedly fecal, and continued to have this character for about a week. The wound then became perfectly healthy and rapidly healed. This patient has gained greatly in health and weight, and has been, up to date, perfectly well.

Case VII

Edgar C. B., a stalwart young man, twenty-one years old, complained of pain in the lower part of the abdomen during the evening of January 13, 1889. The next morning, when he had gone to work, his pain spread through the whole abdominal cavity and became very severe. He reached home with difficulty and went to bed. During the afternoon of the 14th that is, at the end of about twenty-four hours the pain localized itself chiefly in the right iliac and lumbar regions. At noon on the 15th he had a chill, and, feeling very ill, came to the Roosevelt Hospital in the evening. His temperature was then 101.6 , pulse and respiration about normal. The abdominal muscles on the

right abdominal half were rigid, and very acute tenderness was complained of when pressure was made over the right iliac fossa about two inches inside of the anterior iliac spine. No tumor could be felt. The diagnosis of acute appendicitis was made, and I determined on an immediate operation. This was done at 11 P.M., as nearly as possible forty-eight hours after the first symptom. The usual incision was made. The tissues of abdominal wall were found in a normal condition. Beneath the line of incision were coils of non-inflamed small intestine. These were pushed inward, exposing a mass of small intestines matted together by adhesions and quite free from the iliac fascia. After a short search, and after breaking down some of these adhesions, the appendix was found, passing backward and inward from the cecum, the doubling back upon itself. It was closely tied by adhesion to the cecum and adjacent mesentery. The adhesions were broken down, the mesentery of the appendix tied off in sections, and the appendix itself ligated at its base with catgut and removed. The appendix was much diseased, thickened, and distorted, but not ruptured. On section I found within it some black, semi-fluid material. The mucous membrane was gangrenous throughout, and the wall of the appendix at one point gangrenous as far as the peritoneal coat. The stump was sponged with 1-to-1,000 bichloride solution. The up-per part of the wound was closed with silver stitches, a rubber drainage-tube passed down to the stump, and the open wound packed with iodoform gauze. During the next twenty-four hours considerable pain was experienced, and for a few days constipation was obstinate. On the morning of the 17th, the temperature became normal and remained so throughout convalescence, which was unbroken and entirely completed by February 11th. A small superficial ulcer was completely healed on February 21st.

Case VIII

C. G. McK., a young gentleman twenty-three years old. First attack of pain in right iliac fossa two years ago. Second attack in May last, when he was confined to bed five days with fever and severe pain and tenderness in the same region. On Thursday morning, October I7th, he had a sudden attack of severe pain in region of appendix, went to bed, and his temperature was noted to be 99. In the evening his temperature rose to I00. Pain and tenderness steadily increased. Friday he remained in the same condition, and was seen by me, at the request of Dr. E. E. Swift, later at night. The patient was haggard and looked ill. Tenderness on pressure about two inches inside of the iliac spine was very marked. An ill-defined tumor existed, and decided distension of the abdomen. Operation was advised, but the circumstances were such that it was postponed until twelve o'clock on the following day.

Operation October I9, I889. Ether anesthesia. The usual incision was made. On opening the peritoneum, an enormously distended caput coli filled the wound and rendered the search for the appendix extremely difficult, forcing me to handle the intestines far more than was to be desired. The appendix was at last found, flat, wide, and so firmly adherent to the under surface of the cecum as to be identified with great

difficulty, and numerous firm old adhesions prevented the free movement of intestines and at one point formed a nearly constricting band. An indurated mass beneath the center of the appendix was opened with the finger by separating adhesions which, however, were very strong, and many of them evidently old. From this mass about a drachm of foul fecal pus escaped and was sponged away. The difficulty of dissecting away the appendix was so great that I was finally obliged to desist and to be satisfied with removing only that portion of it which formed the wall of the abscess. The cavity was very thoroughly cleansed, and an attempt made to return the prolapsed large intestine and close the wound. This was found to be exceedingly difficult, owing to the very excessive distension of the gut, and much time was expended and much handling of gut necessitated. Finally the wound was closed as in other cases, the lower part being packed and drained. The patient recovered well from the effects of the operation, but at the end of twenty-four hours his temperature rose to IO2 , and the abdominal distension increased. He was bright and looked fairly well, however, and I did not expect serious illness. His temperature, however, continued to rise, symptoms of peritonitis developed, complete paresis of bowel persisted, and the patient died at the end of four days, of peritonitis. No autopsy could be obtained.

Whether the difficult and unusual handling of the intestines was the chief cause of peritonitis, or whether constricting bands, formed by old adhesions, caused action obstruction, I am unable to say. No movement of the bowels could be obtained and no flatus passed after the operation excepting by the aid of a long rectal tube. Certainly the peritonitis was not septic, and such was the opinion of Dr. Delafield and Dr. Swift, who visited the patient with me. Moreover, when, on the second day, I removed the packing, I found a perfectly healthy wound, without the slightest sign of infection. One thing is clearthat, had the operation been done during the patient's first attack two years ago, none of the great difficulties which I met with would have been encountered.

I stated at the beginning of this paper that I did not here intend to review the treatment of appendicitis in a systematic manner, but I should not do justice to the real subject of this writing were I to drop the matter at this point. I must, in the first place, as accurately as possible, define the class of appendicitis to which I have applied the method of treatment described; and then I wish to devote a few minutes to a description of the technique of the operations. I have presented eight cases of appendicitis operated upon at an early state of *acute* inflammatory process. These eight cases include *all* of those operated upon since May 20, I888, to date. Previous to May 20, I888, I had never operated upon a case except by the older methods. During this period of eighteen months I have seen and operated upon a much larger number of cases of appendicitis at late stages in the disease that is, when extensive abscess has existed, and in some cases of early general septic peritonitis due to appendicitis. Such cases are excluded from the list given, as belonging to an entirely different category. I have measured the stage of the disease, not by the number of hours or even days that it has existed, but by the character and extent of the inflammatory process, all cases being included in the list excepting those where it was clear that large, comparatively safe abscess was forming, or where general septic

peritonitis was already established. I should, moreover, state that in every case operation has been done as soon as possible after being seen, excepting that in the fatal case various circumstances, contrary to my wish, necessitated a delay of about twelve hours. In no case has a diagnosis of appendicitis been made which has been subsequently proved by operation to be incorrect. To those who have been in doubt as to whether the operation or the disease carries with it the most danger, I think these cases, although limited in number, must be convincing in favor of the operation. All will acknowledge that every case of appendicitis may, so far as the cleverest observer can tell, have to pass by many very dangerous obstacles before reaching the smooth water of a comfortable abscess. For my part, I would endeavor to insure safety early, before reaching the rapids, rather than trust to finding my way with my *eyes* blindfolded through a dangerous passage. I am familiar with the good-natured jest that the surgeon is now ready to cut every one who has a stomach-ache. The death-rate from appendicitis within the professional circle of New York alone is a sufficient answer to that criticism.

How I should be much misunderstood if I should give the impression that, while I believe the operation to be less dangerous than the disease, I also believe the operation to be simple and easy of execution. I look upon it as often an exceedingly difficult one, and one which requres as much care and patience and attention to detail as any with which I am familiar. Moreover, I have never seen two cases of appendicitis operation upon on which the pathological conditions, the position of adhesions, the relation of surrounding parts, etc., were very nearly alike. Every case presents some new problem, and in every case there is large opportunity for the exercise of careful judgment as to how best to meet this or that difficulty. Of course there must be pioneers, as Sands was, and such may be the most successful, but my strong feeling is that it is well worth while for any one who may have to do this operation to see it done, at least once, first.

Before describing the steps of the operation, I refer again to the important aid to diagnosis of which I have already spoken namely, the ascertaining, by the pressure of a single finger-tip, that the point of greatest tenderness is, in the average adult, almost exactly two inches from the anterior iliac spine, on a line drawn from this process through the umbilicus. Much greater tenderness at this point than at others, taken in connection with the history of the case and the well-known signs, I look upon as almost pathognomonic of appendicitis. This point indicated the situation of the base of the appendix, where it arises from the cecum, but does not by any means demonstrate, as one might conclude, that the chief point of disease is there. The abscess, or concretion, or cyst may be at quite a little distance, but the greatest pain, on pressure with one finger, will be felt at the point de-scribed.

The incision should be a liberal one, for much room may be required, and a five-inch cut in the adult is not too much. It should follow as nearly as possible the right edge of the rectus muscle, and the center of the incision should lie opposite to or a little below the anterior iliac spine, on a line drawn to the umbilicus. When the external oblique aponeurosis is cut through by this incision, the aponeurotic structure, in which the other abdominal muscles end, comes into view, and is easily divided without cutting muscular

fiber. Then the fascia transversalis, the subperitoneal fat, and the peritoneum are cut in succession. If pus has formed close against the anterior abdominal wall, these last-mentioned tissues will be found infiltrated with serum, or even thickened so as to look like cheesy tubercle. Otherwise these parts may appear perfectly normal. On opening the peritoneum the appendix may at once be seen, or adhesions and inflammatory exudations may have so distorted the parts that a careful and difficult search may be required to find the appendix at all. It may be flattened out and glued firmly to the inflamed surface of the cecum by old and recent adhesions, or it may be coiled upon itself and buried out of view in a mass of lymph. The finger is often quicker than the eye to detect the appendix in these conditions, as it is very certain to be found where the greatest thickening, as felt by the finger, exists. More than once I have had to turn the cecum out of the wound and examine carefully the usual region of origin of the appendix before I could identify it. Usually then with the finger or a dull-pointed instrument the adhesions can be broken down or tied off, as may seem required by vascularity. If the appendix has been thus separated, I have usually tied it off with silk or catgut close to the cecum and cut it away, and generally between two ligatures. Careful disinfection of the stump should be made. I have scraped its interior and disinfected with I-to-I,000 bichloride solution, and then rubbed in iodoform. Once, when it looked dangerous, I tied with silver wire, and then used the fine-pointed cautery to disinfect. If thoroughly cleansed, it seems to be unnecessary to lose time in sewing the peritoneum over the. stump, as recommended by Treves. When the appendix has been removed nothing remains to be done but to disinfect the whole neighborhood, insert a drain, and pack the small space with iodoform gauze. The upper half of the wound may perfectly well be tightly closed with stout sutures, which should include the whole thickness of the abdominal wall peritoneum as well. In some cases I believe it to be good practice to introduce a large drain by a separate opening well above and behind the iliac spine, for in some cases the region of disease may extend especially in that direction. But the question may fairly arise in any case as to whether it is wise to attempt to dissect out the appendix and remove it. If the difficulties of dissection would evidently be very great, I think it is better to open the abscess if there is one, cleanse the cavity, and, leaving the appendix *in situ,* pack and drain the wound.* The packing I have usually removed on the third day and replaced it with less, and the cavity has rapidly granulated. If, at the time of operation, one introduced sutures throughout the whole length of the wound, leaving the central and lower ones loose, these can subsequently, after one or two dressings, be tied, and the wound thus rapidly narrowed. Over the whole wound, of course, a complete dressing is applied, and good bandaging is better than any binder, to prevent the possibility of extrusion of gut by ether vomiting or intestinal distension. None of my patients have developed a hernia at the site of operation. I have kept them all in bed for four weeks or more. None have had any recurrence of inflammatory action of any kind.

A few more words, Mr. President, and I have finished. Are there any contra-indications to this operation in a clear case of appendicitis? I think there are. Very great abdominal distension, which might be in a given case probably be relieved by a few

hours treatment, would lead me to delay the operation, for expulsion of intestine is a very serious obstacle to the proper completion of the operation without risk. Unusual obesity I should regard as a good reason for a more expectant method of treatment. But the most important contra-indication of all is the absence of any one of the necessary safeguards and aids, such as the best assistance, the best light, and the best appliances for performing a perfectly aseptic operation.

Note., Since writing the foregoing paper, I have operated in three other cases of acute appendicitis. One of them was that of a lad, fifteen years old, a patient of Dr. G. A. Spaulding's. The operation was done at the fortieth hour of the disease, the temperature being high and the symptoms very threatening. The appendix, much diseased and containing two large concretions, was removed. The temperature fell on the following day to 99 , and has been normal ever since that time. The patient is now safely convalescent.

The second case was that of a patient of Dr. Jarecky's, fifteen years old. The operation was done at the beginning of the fifth day. The appendix, gangrenous at two points as far as the peritoneal coat, was still not perforated even at this late date.

It was removed, and the patient is now safely convalescent.

The third patient, already referred to in a note, is nearly well. None others have been operated on in an acute state of inflammation up to date. The number of operations is, therefore, eleven. Of these, one proved fatal, probably from obstruction by a band not discovered.

* Since reading this paper I have carefully observed three other cases. In two the point of pain shown by pressure with one finger has two inches, and in the other an inch and seven-eighths from the anterior spine.

* In a case operated upon since writing this paper, it would have been a dangerous proceeding to remove the deeply seated and strongly adherent appendix. I broke its wall at one point, and then drained through the loin and packed in front. The treatment was completely successful, and the patient is safely convalescent.

ON THE AMOEBA COLI IN DYSENTERY AND IN DYSENTERIC LIVER ABSCESS

Sir William Osler, 1st Baronet, M.D.

William Osler (1849-1919) was a remarkable physician and historian. He was considered by many to be the Father of Modern Medicine, though he felt that honorary title should belong to Avicenna the 10th century Persian physician. His textbook *The Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine* published in 1892 secured his role as the world's leading authority in the teaching of modern medicine. Presented here is an example of the immortal William Osler's clinical observations as published in *The Johns Hopkins Hospital Bulletin* 1: pp. 53-4, in 1890. (White 2009)

The first observation on rhizopods, as human parasites, was made by Lamb in the year 1859,[E] who found in the mucus of the bowel in a child dead of enteritis, amoeboid bodies and other rhizopods belonging to the *difflugia* and *arcella* types. Leukart doubts whether these forms could be definitely regarded as parasitic. The first satisfactory studies on the subject were made by Losch,[Q] of St. Petersburgh, who found the parasites in the stools in a case of ulcerative inflammation of the colon. They were in extraordinary numbers and presented all the characters of amoebae. The movements were extremely active and the elaborate description which he gives, might have been written from a study of the specimens in which we have here been interested. He injected the stools containing amoebae into the rectum of three dogs, in one of which, at the end of eighteen days, the amoebae were found in large numbers in the mucus of the bowel and at the basis of a small ulcer which had formed.

Kartulis,' stimulated by the observations of Koch, who found, during his cholera investigations in Egypt in 1883, amoebae in sections of the intestines of persons dead of dysentery, examined 150 cases in a period of two years and in every one found these organisms in the stools. In twelve post-mortems the amoebae were present in the ulcers in every case.

They were present in all stages of the disease, in both acute and chronic cases.

He has extended his studies on this question to the liver abscesses, which occur so often in connection with dysentery.' In an examination of twenty liver abscesses he found the amoebae in sections of the walls in every case. In one instance he found a living amoeba in the pus of the abscess, examined fresh after death. They presented the same

characters as the parasites which he had found in the large intestines. In Virchow's Archiv, Bd. 108, he gives a fuller account of his observations. He has met with the parasites in more than 500 cases of dysentery, and in all the cases of liver abscess due to this disease which he has examined. In thirteen of twenty-two instances of these abscesses cultures were made, eight of which were negative; in three there were *staphylococci,* in one the *bacillus foetidus* and in one the *proteus vulgaris.* He holds that the amoebae, which exist in all the layers of the intestines in dysenteric ulceration, pass with the micro-organisms and detritus through the portal veins to the liver. The micro-cocci excite the suppuration, but only in consequence of the lesions induced by the amoebae. The pus seems to die rapidly in the abscesses, but the amoebae remained alive for a much longer period, often over two months. Histologically, Kartulis describes three zones in the abscess wall, first, the detritus zone, containing fibrous granulations and amoebae; second, the cell zone, consisting of young cells which stain deeply and between which can be seen portions of liver tissue, liver cells and capillaries, and third, the limitation zone, separating the disease from the intact liver tissues. His most recent communication is in the Centralblatt fur Bakteriologie, No. 2, 1890, in which he reports two cases of dysentery which had originated in Athens, in both of which amoebae were present in the stools, similar in character to those met with in the Egyptian dysentery.

Massiutin[5] has studied this question under Losch's supervision. He has found the parasites in five patients one, a case of chronic dysentery of seven years standing; the second, a man with chronic intestinal catarrh; a third, a case of typhoid fever with late diarrhoea and much mucus in the stools; the fourth and fifth were cases of diarrhoea with fluid mucoid stools. The amoebae presented active movements and seemed to have the same characters as those de-scribed by Kartulis. He doubts their connection with the intestinal condition. He thinks that they gain access to the intestine through the water and find in the mucus of the colon situations suitable for their growth.

Baumgarten6 comments as follows upon the view of Kartulis that the amoebae constitute the exciting agents in the disease. "We will not contradict this view, although, as many old and recent observations show, very similar amoeboid forms occur in other intestinal affections and even in normal faeces. We regard it, however, as unlikely that the amoebae could induce all of the conditions in the dysenteric processes. Dysentery consists anatomically in a combination of diphtheritic and purulent inflammation, which induces rapid and deep ulceration of the affected part. We have no analogy to show that amoeboid parasites can induce ulceration and we rather believe that the pyogenic micro-organisms, well known as exciters of ulcerative processes, are concerned with the amoebae in the causation of tropical dysentery."

This practically embraces the entire literature of the subject. I had, after the publication of Kartulis' paper, made several examinations in Philadelphia with negative results. During a visit to the Hospital, Dr. Lutze,[7] last October, stimulated our interest in the matter as he stated that he had frequently met with the parasites in tropical dysentery. We have since had opportunities of examining several instances of the local dysenteric attacks, and in one case we thought we had found the parasites but we were

not very confident. Recently, however, a case has been under observation in which the amoebae have been found, not only in the stools, but in enormous numbers in the pus of abscesses of the liver. The details of the case are as follows:

> Dr. B., age 29, resident in Panama for nearly six years, where he had had several severe attacks of dysentery, or indeed, more correctly speaking, a chronic dysentery, came north in May, 1889, and after remaining for a short time at his home in Baltimore, went to Germany. He had intervals of freedom from the diarrhoea but in Vienna it recurred severely. He returned to this country in December, and shortly afterward began to have an irregular fever with occasional chilly sensations and sweats, to lose flesh and to have a very sallow complexion. These symptoms persisted through January, and about February 15th I saw him in consultation with Dr. Friedenwald. His general condition was very good, considering that he had had severe dysentery and an irregular fever for more than two months. The liver was slightly enlarged anteriorly but not specially sensitive. Posteriorly, there seemed to be a very distinct extension of the dulness upward. He had six or eight mucoid stools with traces of blood daily. I saw him subsequently on four occasions and the symptoms remained practically the same. The temperature rose each day to about 103^0

There were no positive chills but occasionally toward the afternoon he complained of sensations of cold. The diarrhoea lessened and his appetite improved, but in spite of this he had lost flesh and strength. Anteriorly, the liver dulness was not much increased, but behind it extended nearly a hand's breadth above the normal limit. There was distinct sensitiveness on deep pressure below the edge of the right costal cartilages, and he complained of a dragging pain whenever he turned upon his left side. The suspicion entertained at first that he had abscess of the liver was gradually confirmed, and on March 22nd Dr. Tiffany aspirated, and then incised and drained two large abscess cavities in the right lobe of the liver. The pus was thick, of creamy consistence, in color, in places slightly bile-stained, but it had not the reddish-brown and anchovy-sauce-like appearance presented by the pus in many cases of hepatic abscesses.

I made an examination of the pus at the Biological Laboratory, within three-quarters of an hour of its withdrawal and found in it, in large numbers, the amoebae which Kartulis had described. The material was taken at once to the Pathological Laboratory where Prof. Welch and Dr. Councilman confirmed the observation. On the first two days the amoebae were quite numerous and very active. For the three following days they were still found, but moving forms were not so common, probably owing to the fact that stronger solutions of bichloride were used for irrigation. Subsequently they were very numerous, and we found them each day, in the pus as it came from the drainage tube, until his death on April 15^{th}.

After the operation the dysenteric symptoms did not abate in the slightest; he continued to have from eight to sixteen movements daily. They varied a good deal in

character, some were entirely mucoid streaked here and there with pus and presenting a few grayish shreds. Some were made up of a greenish, pultaceous mass, in which, on several occasions, there were large irregular sloughs. These mucous stools were usually slight in amount. Occasionally there was a large brownish liquid evacuation, in which could be seen small grayish-white masses embedded in blood-stained mucus. On each day there were found in these stools many characteristic examples of the amoebae. They were most abundant in the small grayish-white shred masses, which in some places seemed almost infiltrated with them.

Description of the amoebae.

(a) From the liver. The size ranged from 10 *p.* to 20 *p.,* which appears to be somewhat greater than indicated by Kartulis. When at rest the outline was usually circular, occasionally ovoid, but when in motion they presented, as shown in the figures, the extreme irregular contour of moving amoeboid bodies. The protoplasm could be distinctly differentiated into a translucent homogeneous ectosarc or motile portion and granular endosarc containing the nucleus, vacuoles and granules. The hyaline ectosarc was, as a rule, very distinct and in many examples the granular protoplasm of the interior was surrounded by it as a distinct rim. Occasionally a form was seen in which this portion was much less developed and the greater part of the organism seemed composed of granular substance. Within the endosarc, the vacuoles constituted the most striking feature. Some-times the interior substance appeared to be made up of a series of closely set, clear vesicles of pretty uniform size. As a rule one or two larger vacuoles were present, the edges of which were not infrequently surrounded by fine dark granules. I never saw a true contractile vesicle which displayed rythmical pulsations but the larger vacuoles underwent at times changes in size. The nucleus was plain enough in some examples, in others very difficult or impossible to detect. It was usually pale, ovoid or rounded in outline and with a very delicate contour. No distinct nucleolus was seen, though there were sometimes coarser granules which possibly represented it.

When once recognized, there was not the slightest difficulty in distinguishing these bodies, even when at rest, from the pus elements, not only by their size but by the entirely different appearance of the protoplasm. The movements, however, constitute their most interesting and distinctive feature. From any portion of the surface, a rounded hemispherical knob would project and with a somewhat rapid movement, the process extended and the granules in the interior streamed towards it. As in the pond amoebae, the clear ectosarc seemed to initiate and play the important part in the movements. Though sometimes slow, many examples were found in which the alterations in contour and the change in locality were quite as striking as in the large active forms of pond amoebae. The processes were always rounded, never angular or linear as in the white blood corpuscles. Motile forms were found each day in the pus during his life. They seemed at times more active apparently than at others, and the movements went on at the average laboratory temperature, but seemed increased by heat. They continued active for hours at a time.

Twice the movements were observed to continue in the same organism for more than ten hours.

(b) The amoebae from the stools. During the month or more in which the patient was under observation, the diarrhoea was a marked feature. Tenesmus was rarely present and the frequency of the stools was from four to twelve in the twenty-four hours. The character varied very much. Sometimes he had a large brownish fluid evacuation with little or no mucus; more frequently three or four ounces were passed at a time and scattered through the brownish liquid mucus, blood and small whitish sloughs could be seen. On several occasions, the stools seemed to be made up of a gelatinous mucus, streaked with blood, and twice large grayish sloughs were found. Experience showed that the amoebae were rarely found in the brownish liquid stools. In the mucus they were more frequent, but they were met with in large numbers only in the small grayish fragments, portions, no doubt, of sloughs which were present in variable numbers in almost every mucoid stool.

The general character of the amoebae corresponded in every particular with those found in the liver. A greater variation, perhaps, in size was noticed, but in the appearance of the protoplasm, the character of the movements, and the arrangement of the vacuoles, no essential difference was noted.

It is impossible to speak as yet with any certainty as to the relation of these organisms to the disease. The subject is deserving of extended study, and a point of special interest will be the determination of their presence in the endemic dysentery of this country.

NOTES

Quoted by Leukart, Parasiten, zwte Auglage, Lief, I, p. 233.
Virchow's Archiv, Bd. 65.
Virchow's Archiv, Bd. 105.
Centralblatt fur Bakteriologie and Parasitenkunde, 1887, p. 745.
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Now the government medical officer for the study of leprosy in the Sandwich Islands.

THREE LECTURES ON SOME POINTS RELATING TO INJURIES TO THE HEAD

William Henry Battle, F.R.C.S.

William Battle (1855-1936) was an excellent English surgeon and clinical pathology scholar. His detailed description of postauricular ecchymosis indicating fracture of the base of the skull is invaluable to the emergency physician. This hemorrhage from the venous sinus follows the fracture lines and diffuses into the tissues behind the ear. Only in the last decade with advanced computer imaging have hidden basilar skull fractures been detected that presented without postauricular ecchymosis (Battle's sign). A new important physical sign of these occult temporal bone fractures is the triad of facial palsy, nystagmus, and facial paresthesia gradually increasing over several days, that occurs without any of the pathognomonic signs of postauricular ecchymosis, cerebrospinal fluid otorrhea, cerebrospinal fluid rhinorrhea, or inner ear haemorrhage. This triad finding is due to secondary neurapraxia of the VII, VI, and V cranial nerves. The sign is pathognomonic of a longitudinal fracture of the temporal bone whereas transverse fractures involve the labyrinth and the VIII cranial nerve resulting in neural hearing loss, as well spontaneous nystagmus. William Battle's original lectures are presented here by BMJ Publishing Group Permissions: William Henry Battle, 1890, British Medical Journal, pp. 75-81. (White 2009)

MR. PRESIDENT AND GENTLEMEN, I would now direct your attention to other evidences of fracture of the base of the skull, the escape of blood from the seat of fracture, and its appearance under the conjunctiva or over the mastoid process. An effusion of blood into the cellular tissue of the orbit is one sign of the presence of a fracture of the anterior fossa of the base of the skull. This effusion of blood may be limited to the eyelids at first, and then spread to the ocular conjunctiva; it may take place into the back of the orbit, and then spread forwards, only showing itself in the conjunctiva after the lapse of some hours or days, and then spread to the lids; it may be small in quantity, or sufficient to produce exophthalmos. The value of orbital extravasation as a sign of fracture is largely dependent on the question of its position (sub-conjunctival or not), and the quantity in which it presents. Other signs, such as epistaxis from the nostril of the one side on which the fracture is , and the position of the injured part must be considered. Most are familiar with the appearance of the eye when there is

this haemorrhage under the ocular conjunctiva; in extreme cases it forms an elevated brownish-red circle, which encloses the cornea, and contrasts strongly with the colour of the iris of the patient. Usually disappearing in the course of a fort-night or so, it may last a long time, the blood not being absorbed for weeks; I have watched its gradual disappearance over a period of from six to seven weeks. In four cases, all of which recovered, there was much protrusion of the eye on admission, and that to an extent sufficient to interfere with the action of the ocular muscles. In one case, that of a man of 25, there was slight proptosis on admission; next day there was more marked but still moderate protrusion of the eyeball, which was displaced down-wards and towards the middle line, the movements being limited in every direction, chiefly outwards. There was no ophthalmoscopic change. On the third day there was considerable subconjunctival ecchymosis. In sixteen patients there was orbital effusion in the lids when they came in, which subsequently spread to the conjunctiva. In four subconjunctival ecchymosis appeared on the second day, in three on the third, and in one on the sixth. Of the fatal cases, ecchymosis of the conjunctiva was not an invariable symptom, for in two out of fourteen there was none, the fracture being correctly diagnosed by the severe epistaxis, and in one, where the lesser wing of the sphenoid was splintered, the haemorrhage did not show in the conjunctiva for at least ten hours after the injury. Again, in the case in which the anterior clinoid process was the only part of the base broken, contusion of the lids and extravasation in the conjunctiva, were evident from the first.

In fractures of the malar and superior maxillary bones blood may be extravasated into the lids and under the conjunctiva; this is a rare occurrence which might lead to error in diagnosis. Mr. Holmes' has recorded a case. Another sign of fracture of the base of the skull is the appearance of extravasated blood in the mastoid region after an injury to the head. I must ask you to consider this sign somewhat fully, for I consider it under certain circumstances to be a most important indication that the posterior fossa of the skull is the seat of the fracture. Sir Prescott Hewett writes: "Extravasation of blood, and consequent discoloration of the skin, appearing in the mastoid region some hours after a severe injury to the head, may lead to the suspicion of a fracture involving the posterior part of the base; and all the more valuable will this sign become if the injury did not bear directly upon this region, and especially if it bore upon the opposite side of the head."[2] Observations on this subject lead me to the following conclusions with regard to "mastoid ecchymosis." That it appears in the first place in front of the apex of the mastoid process. That it often spreads upwards over the mastoid in a line, slightly curved, and with the convexity backwards, its direction being approximately that of the outline of the external ear, from which it is distant half to three-quarters of an inch. At the end of three or four days after its appearance it diffuses itself forwards and backwards, chiefly in the latter direction, is most marked in the original line, and then gradually disappears. That it usually shows from the third to the fourth day after the injury, but its appearance may be delayed until the twelfth or fourteenth day. [If the injury which is in the occipital region is to the right of the middle line, the ecchymosis will appear on that side over the anterior part of the apex of the mastoid process.] That

it may be accompanied with oedema and tenderness over the process. That the duration of the time which elapses between the receipt of the injury and the appearance of the extravasation is to some extent an indication of the distance of the fracture from the process, the blood being compelled to travel by a certain anatomical route in order to reach the surface. That unless search be made for the extravasation it is very apt to be overlooked, as the ear conceals it, especially is the ear is large and the head of patient has not been shaved. Should the fracture have taken place in the middle line of the occipital bone, or should there be two or more lines of fracture diverging towards the foramen magnum from a point in the middle line the extravasation may appear on both sides and at a varying interval.

The following examples illustrate these statements. A man, aged 41, fell and received a scalp wound over the posterior part of the left parietal bone. He was admitted into hospital unconscious, bleeding freely from the ears and nose. On the fourth day there was ecchymosis behind the left ear, from which flowed clear watery fluid. A woman, aged 50, knocked down by a hansom cab, had considerable haemorrhage from the right ear, which ceased during the first night. On the fourth day there was well-marked ecchymosis over the right mastoid process. A man, aged 24, thrown from the driving seat of a van, was admitted into the wards unconscious, with very free haemorrhage from the right ear. On the third day there was an extravasation of blood over the mastoid continuous in a less degree down the side of the neck. Over this area there was much tenderness. This extravasation disappeared in sixteen days, but the tenderness remained for some time longer. A man, aged 40, was knocked down, and struck the back of his head on the pavement. On the sixth day there was considerable discoloration over the occipital bone and behind the ear, and he threw his arms about when touched in that situation. A man, aged 32, was admitted on the fifth day after a fall from a loft, with marked ecchymosis in the mastoid region, and a small scalp wound in the posterior parietal region on the same side. A youth, aged 17, fell fifteen feet, and was found to be unconscious, and with a jagged wound of the scalp on the right side. On the fifth day contusion was seen behind the right ear. A man, aged 47, was picked up insensible after having been run over in the street. On the seventh day there was premastoid ecchymosis on the left side, but it was not until the fourteenth day that it appeared in front of the right mastoid process. A man, aged 37, received a blow from a man's fist, and fell on the back of his head on the pavement, and was brought to the hospital on the third day. There was then ecchymosis over the right mastoid process, which, with other symptoms, was considered to indicate a fracture in the posterior fossa on the right side. A year later he was admitted under the care of Dr. Bristowe with epilepsy, and died. At the *post-mortem* examination the diagnosis was proved to be correct. A man, aged 47, fell seven feet from a wall, producing a superficial scalp wound just behind the right parietal. On the third day some ecchymosis appeared over the right mastoid process. A boy aged 7 fell down a stairway, receiving a small wound in the left occipital region. On the seventh day some ecchymosis appeared over the left mastoid process. A boy aged 12 fell backwards off a brick wall about five feet in

height on concrete pavement. A haematoma was found in the left occipital region. On the twelfth day there appeared some bruising over the left mastoid, especially in the region of the apex of that process. A man aged 21 fell off a cart, his head striking the ground, and was admitted with haemorrhage from the ear. There was no wound of the scalp; but on the fourth day, when his head was shaved, bruising over the back of the head was found, and on the fifth day ecchymosis over the right mastoid process, which appeared at the very tip in the first instance. A boy aged 7, who had fallen down some stone steps, presented ecchymosis behind the left ear on the third morning. A man aged 31 fell seven feet, and complained of tenderness over the mastoid process the same evening; this continued, but it was only on the third morning that ecchymosis appeared over the right mastoid process, just behind the ear, with a little puffiness over the process. Eight days later a note was made to the effect that the bruising over the right mastoid process which followed the outline of the external ear was beginning to fade, though the staining over its anterior border was still well marked, and there was slight oedema on deep pressure, but no longer definite tenderness. A woman aged 55 was knocked down in the street by a cab. On the fifth day there was a well-marked swelling about the position of the posterior superior angle of the left parietal, and ecchymosis was noticed over the left mastoid process. This discolouration was visible for a period of four weeks, and when it had disappeared there was still some tenderness. A man aged 37 fell backwards from a cart on a macadamised road. There was haemorrhage from the nose, mouth, and left ear. On the fourth day there was ecchymosis over the mastoid, commencing to ex-tend backwards. A policeman aged 44 was thrown violently from a light cart on a stone pavement. There was bleeding from the nose and both ears, which continued for some hours. On the third day there was bruising visible over the left mastoid process.

A summary of these cases gives the following result that when, in patients with supposed fracture of the posterior fossa, ecchymosis was first perceived, it was on the third day in six cases, on the fourth day in three, on the fifth day in four, on the sixth day in one, on the seventh day in two, and on the twelfth day in one, whilst in one case it appeared also on the opposite side on the fourteenth day. I am careful to say perceived, for in more than one instance it had probably been overlooked for a time. I have already drawn attention to one case in which a necropsy proved that there had been a fracture of the posterior fossa, of which this extravasation had been the only external sign. What is the evidence afforded by the examination of the fatal cases in which mastoid ecchymosis was observed during life?

An omnibus driver, aged 62, who had fallen on his head on the kerb when mounting to the driver's seat, died nine days later from delirium tremens. On the fifth day ecchymosis was noticed over the right mastoid process. At the *post-mortem* examination Dr. Sharkey found two fractures running from the occipital proturberance obliquely downwards on the right and left. That on the right side was far the most severe, and ran across the groove of the lateral sinus, and across the right petrous bone and middle ear. The fracture on the left only amounted to a crack, which did not allow of movement of the bones on each side of it, and stopped short of the temporal bone.

A boy, aged one year and nine months, who presented, in addition to other symptoms, bruising over the tip of the left mastoid process on the third day, died fourteen days after the injury, and Dr. Sharkey reported as a result of the examination:

> "The left occipital bone was divided by a fracture which ran from the margin of the foramen magnum along the left side to its junction with the parietal; it did not quite go through the margin of the foramen magnum," etc.

The fracture on the left side in the omnibus driver whose case is alluded to above did not give rise to extravasation over the mastoid process, although he lived nine days; it only amounted to a mere crack. That it is necessary for the production of this sign that there should be a complete fracture, one penetrating both tables, was also shown in a patient aged 40, who died from meningitis after an injury to the posterior part of the skull. He was supposed from other symptoms to have received a fracture of the occipital bone, but no mastoid extravasation developed.

At the *post-mortem* examination there was a fissured fracture extending across the left posterior fossa to the middle fossa of the same side, but it only involved the inner table of the bone. The reason why ecchymosis should appear in the situation of the mastoid apex is capable of an anatomical explanation. When a fracture extends through the occipital bone towards the foramen magnum there is an extravasation of blood along the line of fractually usually between the dura mater and the bone, as well as into the muscles and intermuscular planes across which it runs. This extravasation, which varies in quantity, gradually makes its way along the lines of least resistance; in this instance the planes of cellular tissue between the muscles towards the mastoid process, aided in its course by the tonic contraction of the muscles of the part, by movements of the head, and, to some extent, by the pressure of the neck on the pillow. The difficulties presented by a direct route towards the surface in this region are very great, the structures are dense, the muscles overlap to a marked extent, and are sometimes tendinous in origin. Any pressure from within would only make the route to the surface less practicable, excepting the way round the mastoid process. The muscles are covered in by the firm investment of the deep cervical fascia. This, as you will remember, is attached along the superior curved line of the occipital bone from the external occipital protuberance behind to the posterior margin of the sterno-mastoid in front, where it divides, and after enclosing that muscle, the two investments unite again in front of it. The superficial layer passing forwards forms the parotid and maseteric fascia, and then is attached to the zygoma. A prolongation of the deep layer passes behind and to the inner side of the parotid gland to the styloid process. Ascending under cover of the parotid gland to the groove between the cartilage of the ear and the mastoid process is the posterior auricular artery, and it appears to me that it is along this vessel that the extravasion makes its way, probably aided by its pulsation. This would account for the appearance of the ecchymosis in front of the apex of the mastoid process and the course which it takes afterwards over the process.

Mr. E. C. Stabb, the senior resident medical officer at the Royal Free Hospital, has, with me and in my absence, kindly made a series of experiments on the dead subject to test the truth of these statements. The object was to find out the direction in which a fluid would spread when injected amongst the muscles in the occipital region. The fluid used was a solution of Berlin blue with glycerine and water, and the injection was made by means of a syringe and cannula. In order to make the condition more closely approximate that which obtains after a recent linear fracture of the posterior fossa, the cannula was passed towards the foramen magnum and the injection forced in as the instrument was with-drawn; in all cases the puncture was closed, and in some pressure was made over the occipital region by means of an elastic bandage, which was removed several hours afterwards when the region was examined. In six cases (aged 11 months, 18, 36, 39, 44, and 66 years) the solution was injected deeply about an inch and a half midway between the external occipital protuberance and the mastoid process. In all these experiments the tendency of the fluid was the pass forwards and downwards in the intermuscular planes, reaching beneath the sterno-mastoid muscle as far as its anterior border, and in several cases further forwards along the digastric and stylo-hyoid muscles. In one instance, that of the child aged 11 months, it passed nearly down to the clavicle beneath the sterno-mastoid. In no case did it pass through the deep fascia. In four cases (aged 19, 33, 59, and 69) the solution was injected about half to three-quarters of an inch behind the mastoid process. In a very emaciated subject, aged 69, the fluid appeared superficial to the deep fascia just below and in front of the apex of the mastoid process, but not in any quantity, and, so far as could be seen, not in connection with any vessel. The deep fascia was very thin. A better marked result was obtained in the man aged 19, where the fluid was found distinctly passing through the deep fascia and running upwards with the posterior auricular vessels. It had also passed forwards beneath the parotid gland. These experiments, then, go far to confirm my theory as to the route taken by extravasations in the suboccipital region in their progress to the surface, especially when we consider the altered conditions of the tissues which exist after death, the different character of the fluid, the greater resistance to diffusion of fluids, and the shorter time necessarily allowed for the diffusion. The probability is, then, that as the blood extravasated about the fracture is dispersed, it is arrested in its progress across the middle line by the dense fibrous structures met with there, but is gradually forced outwards to the submastoid region, and continuing its course meets with the posterior auricular artery which guides it to the surface. The reason why the occipital artery which is encountered earlier by some of the extravasated blood making its way towards the mastoid process does not guide the extravasation through the fascia and muscles to the surface is probably explained by its oblique course with regard to the muscles, any increase of tension under the fascia of the region making the muscles act in a valve-like manner and pressing them against the vessel.

Extravasation of blood into the neck is said to be an occasional cause of a discoloration of the integuments over that region, and an aid to diagnosis in cases of fractured base; but, as in the case of the “black eye,” is more frequently the result

of direct injury and bruising of the part where it manifests itself; and it must be borne in mind that ecchymosis about the mastoid process will occasion-ally be met with under similar circumstances. I was recently asked to see a case of supposed fracture of the posterior fossa of the base of the skull in which this was present; there was, however, no difficulty in discriminating between the two conditions, for the discolouration had appeared soon after the infliction of the in-jury, was not limited to the mastoid region or more intense in that part, and was apparent also over the ear and temporal region.

On the Occurrence of Optic Neuritis in Head Injuries

For many years it has been known that injuries to the head are occasionally followed by optic neuritis, and isolated evidences of this fact are to be met with in our literature; but no systematic or continued investigation was on record in this country before the communications of Mr. Edmunds and Mr. Lawford to the Ophthalmological Society on that subject. These gentlemen have investigated this question from a clinical as well as from a pathological aspect, and in their last paper, which was read in July, 1887, the result of their investigations in twenty-four cases is given, with the conclusions to which they have come.3 I do not think it necessary for our present purpose to consider the cases brought forward by them in which optic neuritis was not found, either on ophthalmoscopic examination during life or on microscopical examination of the optic nerves after their removal from the body after death. Frequently during the progress of a patient towards recovery after an injury to the head often, too when the tendency was to a fatal termination repeated examinations with the ophthalmoscope have revealed no change in the condition of the discs, and this statement applies to all kinds of head injury from slight concussion to compound comminuted fractures of the skull with wound of the brain substance. Then, again, it is well to exclude those in which the injury to the frontal region was followed by signs of inflammation in the eye of the corresponding side inflammation which not infrequently passed on to atrophy of the disc and permanent blindness, as cases which I will mention later prove. Two of the cases given by Messrs. Edmunds and Lawford' come under this heading, and twelve under the former. We have, then, ten remaining from their series for consideration, and to these I add seventeen which have been observed by me since they made their communication to the Ophthalmological Society. It would perhaps be as well to mention here that their investigations were made in cases which I was enabled to ex-amine, and that the majority of those, the notes of which I propose to read presently, were also examined by them, by Mr. Nettleship, or by the ophthalmic assistant at St. Thomas's Hospital, with the exception of Case VIII, which Mr. Mackinlay kindly saw. These seventeen cases are as follows: Nine recoveries, in which the base was supposed to have been fractured; three fatal cases, in two of which a fracture of the base was proved at the *post-mortem* examination, and in one of which a fracture of the middle fossa was diagnosed, but *a post-mortem* examination not obtained; four recoveries from concussion of the brain,

in which optic neuritis was found; and one fatal case of bullet wound of the brain, in which there was a second attack of optic neuritis.

I will now read short notes of the cases in which optic neuritis was present, and in which recovery from the head injury as well as from the neuritis ensued. In the majority of them examination of the urine proved the absence of albumen, and no evidence of syphilis could be obtained.

Case I

A butcher, aged 32, was under the care of Mr. Clutton in St. Thomas's Hospital from August 19th to September 10th, 1887. He had fallen from a ladder 10 feet high four days before. He suffered from very severe headache, and there was a mark of injury over the back of the head, with slight wound. On the fifth day after admission the edges of both optic discs were noted as hazy and obscured; veins full; tortuosity of some smaller vessels at the edges of the optic discs. On the nineteenth day Mr. Nettleship reported that both optic discs were hazy; veins rather full; changes more marked in the left, where they were conclusive of papilitis; in the right, taken alone, they were of doubtful meaning.

Case II

A man, aged 24, was under the care of Sir Wm. MacCormac from April 8th to May 8th, 1887. He had been pitched on his head from a cart. There was profuse and prolonged bleeding from the ears, and he was unconscious for some hours. Next day he was restless, and fighting to get out of bed, and at night delirious, with a temperature of 104 ; he was very irritable at times. On the eighth day Mr. Robert Nairne found both discs slightly hazy, but without enlargement of vessels. On the eleventh day the left disc was more clearly defined, but examination was difficult, as the patient was very irritable, and resisted.

Case III

A greengrocer, aged 47, was under the care of Mr. Mackellar from September 29th to October 20th, 1887. He had been run over, and continued unconscious for some time. On recovery he was drowsy, and complained of headache. Mr. Wingfield-Roll, who examined the eyes, reported on the sixth day that the appearances were highly suggestive of optic neuritis; both optic discs were rather hazy, with slight swelling, especially in the right; the veins were full; there were no haemorrhages; and on the eleventh day the condition was more marked.

Case IV

A man, aged 37, under the care of Mr. Mackellar from July 29th to September 10th, 1888. He was admitted in a drowsy condition, with headache on the third day, after having been knocked down and injured his head. On the eighth day after the accident

both optic discs were swollen, and their margins could not be made out; the vessels over the discs were very indistinct, but swollen over the adjoining part of the retina; and on the twenty-second day Mr. Lawford, who examined the patient, re-ported there was no swelling of the discs, but the vessels were all bordered by white lines, and the tissue over the surface was somewhat opaque. The appearances would quite support the diagnosis of an attack of optic neuritis some time previously.

Case v

A man, aged 47, under the care of Mr. Croft from July 18th to August 5th, 1888. He had fallen from a wall, and been unconscious for half an hour. There was a superficial scalp wound behind the right parietal eminence. He complained of some headache, and his mind was obscured. On the fifth day there was impairment of vision, and he could not see so clearly with the right as with the left eye. In the right eye the vessels were swollen and tortuous, and the disc very indistinct; the left disc was not quite clearly defined, but otherwise it appeared normal. On the ninth day there was still well-marked optic neuritis.

Case vi

A boy, aged 12, under the care of Mr. Mackellar from December 20th, 1887, to February 9th, 1888. He had fallen from a brick wall about five feet in height on concrete pavement; was sup-posed to have been unconscious for an hour; symptoms of cerebral irritation. On the fourteenth day he was still very drowsy with headache, and examination of the eyes by Mr. Lawford showed the presence of optic neuritis, moderate swelling of the discs, with much streaky haze, veins full and bending, but no haemorrhages.

Case vii

A woman, aged 23, under the care of Mr. Mackeller from July 8th to the 25th, 1888, was admitted unconscious with haemorrhage from the right ear and mouth, and subconjunctival ecchymosis of the right eye. Afterwards she was noisy and restless. On the ninth day the eyes examined with the ophthalmoscope revealed haziness of the discs, and the margins were ill-defined.

Case viii

A woman, aged 55, under my care at the Royal Free Hospital from December 24th, 1888, to February 13th, 1859. She had been knocked down in the street; she afterwards suffered from headache and drowsiness. The eyes were examined on more than one occasion by Mr. Mackinlay, who reported on the twenty-sixth day that there was undoubted optic neuritis in the right eye. The fundus of the left eye could not be examined on account of the presence of cataract. Nine days later the inflammation was diminishing.

Case ix

In one other case, that of a carpenter, aged 22, who was sup-posed to have received a fracture involving the anterior and middle fossae of the base; slight haze of the disc was noticed on the fifth day, but Mr. R. Nairne, who also examined the eyes, did not think it sufficient to indicate the presence of optic neuritis.

Of the Three Cases in Which this Symptom wasPresent in Fractures of the Base, whichTerminated Fatally.

Case x

An omnibus driver, aged 62, under the care of Sir William MacCormac, who had fallen and received a scalp wound at the back of his head, presented symptoms of fracture in the posterior and middle fossae of the base of the skull. On the sixth day there was commencing optic neuritis. He died on the tenth day with symptoms of delirium tremens. At the *post-mortem* examination there was great bruising of and haemorrhage into the anterior parts of the brain. No meningitis.

Case xi

A leather-dresser, aged 40, under the care of Mr. Sydney Jones from February 2nd to the 12th, 1886, was admitted with very severe headache three days after a fall on the back of his head in the street. He became restless, and meningitis developed. On the tenth day after the accident Mr. Johnstone noted some haze about the optic discs, especially the right, but the man was very irritable, and they were not well seen. At the *post-mortem* examination there was well-marked basal meningitis, and a fissure in the posterior fossa of the skull extending forwards to the petrous bone.

Case xii

A boy, aged 7, under the care of Mr. W. Anderson from August 26th to September 5th, 1886. He had been knocked down and run over in the street, and presented signs of fracture in the middle fossa of the base. Meningitis with hemiplegia developed, and on the seventh day Mr. Lawford reported optic neuritis in both eyes. The patient died three days later, but an examination of the body could not be obtained.

Cases of Concussion, Four in Number, in whichOptic Neuritis Developed.

Case xiii

A man, aged 45, under the care of Mr. Croft from September 14th to October 12th, 1887. He was standing on the edge of a crate, which turned over and fell on him. He became unconscious, and was admitted with a contusion on the right side of

the head and swelling of the right shoulder, stertor, with blowing respiration, a small rapid pulse of 72, and the pupils equally dilated and not acting to light. Two days later he was more conscious, and the respiration was quieter. On the seventeenth day, on ophthalmoscopic examination, the left optic disc was slightly swollen and hazy at the margin, with bending of the vessels; one vessel was obscured by new tissue. The right optic disc presented appearances of a similar character, but they were less marked. The highest temperature was 99.6.

Case xiv

A tramcar conductor, aged 26, was under the care of Mr. Mackellar from July 8th to the 29th, 1888. He had fallen off the car steps on his head. He never became unconscious, but was sick soon afterwards. When admitted, after a long walk, he appeared dazed. There was a haematoma over the vertex and right temple; pupils normal. He vomited from time to time during the remain-der of the day and suffered from headache. On the following day there was a slight rise of temperature to 100.2; the sickness has passed off, but there was still headache. On the seventh day there was much pain in the right temporal region, and the right pupil was the larger. On the tenth day both optic discs were found to be much swollen and hazy, and the retinal vessels were enlarged. In this case the temperature was generally over 99 and under 100 in the evening until the ninth day.

Case xv

A carman, aged 40, under the care of Sir W. Mac Cormac from October 25th to December 15th, 1886. He had fallen from a cart and received a superficial scalp wound in the occipital region. Was suffering from shock on admission, then passed into a deep sleep, which gave rise to a drowsy condition, from which he was roused with difficulty. The temperature was frequently elevated, 100 to 102, occasionally rising to 102.6; and on the sixth day he had a severe convulsive seizure. Afterwards there were drowsiness and frontal headache. The fits continued at intervals until the tenth day, when they ceased. After this there was delirium, with sleeplessness and occasional fits. On the fourteenth day he was sensible again, complaining of headache, but was still violent at night. The evacuations were passed involuntarily. Was quite sensible on the twenty-fourth day, and then improvement continued. Mr. Nairne reported haziness of the discs, with dilatation and tortuosity of the vessels, on the sixth day. Mr. Lawford examined the eyes eighteen days later, and found slight but definite papillitis present.

Case xvi

A gentleman, aged 30, who came under my care a week after falling on his head. There had been loss of consciousness for an hour or two, with vomiting. Since that time

drowsiness and severe headache with intolerance of light, but no blindness. Examination of the discs showed well-marked swelling and haze about the tenth day. He was kept quiet. Under treatment the symptoms all rapidly subsided.

The following is a most interesting example of bullet wound of the brain:

Case xvu

A boy, aged 11, was under the care of Mr. Mackellar from April 13th to October 12th, 1887. There was a wound caused by a revolver bullet of small size, two inches above and an inch and a half in front of the left external auditory meatus. Two days after admission optic neuritis developed. Mr. R. Nairne reported: "Both discs slightly hazy and congested. The large vessels, both arteries, and veins dilated; all the small vessels running over the edge of the disc appear more evident than normal." On the third day he was trephined. On the sixth day Mr. Nairne noted more haze, with definite swelling of the discs on each side, especially at the lower edge. On the eighth day the swelling was more marked in the right eye; there were no haemorrhages. On the eighteenth day, still marked neuritis in both eyes; swelling not great, but more in the right than in the left. Much shot-silk appearance of retina and a few bright spots in the right yellow spot region. On the thirty-seventh day Mr. Wingfield-Roll reported that there was still slight haze, with moderate swelling; veins on both sides large and tortuous; and on August 8th, nearly four months after the injury, some streakiness about the optic discs, with a little haze of the retina surrounding them. One or two dots of black pigment near the optic discs, possibly the remains of haemorrhages. More streakiness and haze in the right. Hernia cerebri developed after the operation to a considerable extent, but gradually subsided, and the patient went to a convalescent home. He was again in the hospital, under Mr. Mackellar's care, from October 29th to December 4th of the same year with traumatic epilepsy. Ophthalmoscopic examination showed the veins very tortuous near the discs, which were not pale. They had a good colour, but some streakiness at the edges; there was nothing further to indicate that there had been optic neuritis on any previous occasion. When he left he was very dull, and avoided the sunlight; had no fits or headache, but staggered occasionally in walking. He was again admitted about eight months after receipt of the injury, and died early in 1888, forty-one days later. He had suffered from fits, pain in the left side of the head, loss of power in the right arm, right facial paralysis, vomiting, and bulging of the scar. After admission Mr. Wingfield-Roll found moderate papillitis, with tortuosity and abrupt bending of the veins at the edges of the disc, obscured by streaky haze; changes less in the left eye. And two days later Mr. Nettleship reported "well-marked papillitis of each, with moderate steep swelling, without haemorrhages." On the twenty-third day, aspiration through the scar drew off a drachm of clear fluid; on the twenty-seventh, Mr. Mackellar explored the brain, removing more bone. Hernia cerebri again developed, and an abscess cavity was incised. At the *post-mortem* examination there was a thick-walled abscess cavity in the posterior part of the left frontal convolution, extending into the white matter of the

parietal and temporo-sphenoidal lobes and basal meningitis. The bullet was found in the white matter of the right frontal lobe low down, surrounded by apparently healthy white matter. The track made by the bullet to reach that situation could not be traced. I have given this case more in detail than the others, as it is an example of neuritis affecting the optic nerves for a second time, when the first attack had been severe, but completely recovered from. It will be noticed that, although the inflammation was very marked in many of these cases, no haemorrhages were at any time found by those who examined them, and in only one was there any complaint of blindness. Taking, then, the four cases of recovery from optic neuritis (that is, excluding the two cases in which one eye only was involved) and the two other cases which proved fatal, and in which evidence of inflammation of the nerves was present during life, we have a total of six from the series by Messrs. Edmunds and Lawford which we can compare with those which I have just given. I would not, however, have it thought that I am detracting from the value of their observations on the subject. This is not my intention. I am simply desirous of investigating the usefulness of this sign as an evidence of fracture of the base of the skull or injury to the base of the brain, and put on one side those cases which do not appear to assist in the elucidation of the question as to the importance of optic neuritis as a clinical sign.

I should like, however, before proceeding further, to refer to the results of the microscopical examinations made by Messrs. Edmunds and Lawford in four cases which proved fatal from the severity of the injury, and in which the base was involved. In two of them which were examined the patients had only lived twenty-four hours after the injury. The result is thus summarised: "In those four cases in which there was neuritis the changes observed with the microscope were, in one case, present throughout the whole length of the nerves, but confined to thier surface (perineuritis), and in the remaining three cases the changes did not extend throughout the whole length of the nerve, but were only found at its proximal part, and in one of these three the hyperneucluation was more marked at the surface of the nerve than in its interior."' The microscopical changes are well illustrated in their paper, and through the courtesy of Mr. Edmunds I have been enabled to examine the microscopical sections of the nerves from which the illustrations are taken. The change from the normal which is found consists in a considerable increase in the number of staining corpuscles seen in the sections, especially in the trabeculae existence of fluid between the outer and inner nerve sheath, and others from another case the presence of inflammation almost entirely limited to this space, with but slight changes in the nerves themselves. It is evident, then, that the inflammatory process may commence very soon after the injury, and microscopical evidence may be afforded within a comparitively short time. What is the period at which we are most likely to meet with it at the bedside? This is a question that I am not able to answer definitely; I can only mention the times at which it was found. Often the patients were too irritable to permit of examination during the first day or so after admission, and others were not examined until some special symptom, such as headache, made it appear possible that there might be a neuritis. Of the cases in which the base was fractured, in three it was

found on the fifth day, in three on the sixth, in one on the seventh, in two on the eighth, in one on the ninth, and in one on the tenth day, and not until the fourteenth in one and the twenty-sixth in another, though repeated examinations were made. In the cases where concussion was present without evidence of injury to the bones it was found on the sixth day in one, the tenth in two, and the seventeenth day in one; whilst in the case of bullet wound on brain it was found when the boy was examined two days after the injury. It is not possible to give the approximate date of onset of the second attack.

Messrs. Edmunds and Lawford conclude that "optic neuritis occurs with greater frequency in those cases in which the base of the brain or skull is affected than in those in which it is not."[6] The cases which I have given support this conclusion. I would even go further, and add that it is much more likely to follow injuries inflicted on the posterior part of the skull than on the lateral or anterior aspects. Thus it was found in two patients in whom fracture of the middle fossa was diagnosed, in one with probable fracture in the middle and anterior fossae, in three with fracture of the middle and posterior fossae, and in six in which fracture of the posterior fossa was alone present that is, there was a fracture involving the posterior fossa in nine out of twelve fractures of the base in which optic neuritis was found a very large proportion.

Dr. C. S. Jeaffreson, in a recent lecture on Optic Neuritis,' says that injuries to the head are not a very common cause of optic neuritis unless they are severe and attended with fracture in the neighbourhood of the optic foramen. I agree with the earlier part of his statement, but have not met with any cases that appear to confirm the latter as to the frequent existence of fracture in the vicinity of the optic foramina. It may be, however, that his remark is intended to apply more to the affection of one nerve, and is founded on the statement of Van Holder as to the frequency of fracture in that situation.

That optic neuritis may be the result of extension of inflammation of traumatic origin from the membranes of the brain is shown by examples only too numerous. Here the menigitis has produced symptoms leading to diagnosis of the disease before the ophthalmoscope has given evidence of the inflammation of the nerves; it is simply confirmatory of the opinion to which the surgeon has already come. Messrs. Edmunds and Lawford are inclined to think the neuritis to be due to a meningitis of the base even in the cases that recover, and this seems the most likely explanation; if it is so, however, we must suppose a very localised and subacute inflammation not sufficient to produce any effect on the temperature curve, for, as shown by the charts of the temperature in cases apparently uncomplicated by wound of the soft parts, severe cerebral contusion or fracture communicating with the external air, the temperature may be below normal when the optic neuritis is at its height, judging from ophthalmoscopic examination. It is not improbable that the inflammatory process is started most usually by a contusion of the brain substance in the neighbourhood, and then passes along the cerebral membranes to the optic nerves. We know how frequently contusion of the under part of the frontal lobes is found after death when the fracture is situated in the posterior fossa of the skull; and I have shown that it is in these cases that we most frequently meet with optic neuritis after a fracture of the base.'

Injuries of the Cranial Nerves.

Loss of function of one or more of the cranial nerves is not unusual after an injury to the head of some severity, but cannot be described as a symptom of fracture in every case, even when the evidence of the injury to the nerve is at once manifest. The olfactory nerves have been torn across in a fracture of the base of the skull, and it is stated that paralysis of these nerves not infrequently follows severe injuries to the head without evidence of fracture. Loss of smell was complained of by only one of the patients who were under my observation. Examples of injury to these nerves were afforded by the *post-mortem* examination of two cases; in one there was contusion of the frontal lobes of the brain, with both fracture of the posterior and anterior fossa, and the olfactory nerves were much involved; in the other there was a similar injury to the brain in the frontal region with a fracture in the posterior fossa, and the left olfactory bulb was crushed like the brain substance. These cases are confirmatory of the opinion expressed by Sir Prescott Hewett[9] that loss of smell is most likely to follow injuries in which the anterior lobes of the brain are driven against the bone and bruised. The optic nerves may be injured in a thrust wound of the orbit, the instrument which produces the fracture of the bone dividing or lacerating the nerve. They may also be divided by a bullet, sometimes without injury to the brain, in its progress across the head from temple to temple. Such cases are recorded in the *Surgical History of the American War of the Rebellion,* and are rare in civil practice. I saw one such, however, under the care of Mr. Sydney Jones last year, in which the injury had been self-inflicted with a revolver.

A curious instance of damage to one optic nerve from a bullet wound was under my close observation in 1876. A boy, aged 15, was admitted under the care of Sir W. Mac Cormac with a wound of the upper and inner angle of the right orbit, caused by a bullet from a revolver a short time previously. This injury was immediately followed by loss of sight in the eye of the opposite side. A probe passed along the track of the bullet went backwards and to the left for three inches and a half. He was suffering from shock but no symptoms developed. I saw him some years later, and the eye remained disabled, with an atrophied disc. Pressure upon the nerve by a fragment of the broken sphenoid bone has produced complete blindness.

Dr. Berlin read a paper at the International Medical Congress of 1881 on Injuries to the Optic Nerves and Ophthalmic Artery from Fracture of the Optic Canal, and detailed three cases, one of gunshot injury, with a fissured fracture of the roof of the canal, a second of fissured fracture through both optic foramina, and a third of laceration of the internal carotid, with fracture of both optic canals, in each of which there was a laceration of the nerves.

The injuries which caused these fractures were necessarily severe and fatal. Van Holder considered fracture of the optic canal as very frequent in fractures of the base, and Dr. Berlin thought that sudden single amaurosis, following immediately after injuries to the head was usually due to this cause.

Mr. Nettleship[12] in a clinical lecture gives an account of some cases of injury to the optic nerve which he had observed. Three of them were under treatment in St.

Thomas's in 1881, and I have notes of two cases's under care since that time in the surgical wards, in both of which there was evidence of severe injury to the head, with proptosis, followed by atrophy of the disc and blindness. In one, atrophy was visible on the seventh day, and Mr. Nettleship noted on the twentieth day that there was still interference with the action of the muscles, and a thickening of the orbital roof. A coal porter,[14] aged thirty, was admitted under the care of Mr. Sydney Jones on March 27th, 1884, having fallen twenty feet half an hour previously. He had been unconscious for a short time. He was a stout, heavy man, suffering from shock, cold and shivering, but conscious. Pulse 112. There was a wound of the upper lip, a wound of the nose, at the bottom of which could be felt a fissure of the bone. Much ecchymosis of the cellular tissue of the eyelids of both eyes was found, and on the right side it was already present under the ocular conjunctiva. There was slight haemorrhage from the nose, mouth, and left ear. The bones of the face were fractured and separated, and fracture of the radius on both sides. The patient was noticed to be blind of the left eye on the fifth day, the left pupil was larger than the right, and did not respond well to the action of light. As the swelling in the eyelids subsided, it became possible to examine the eyes more fully, and on the eighteenth day a note was made to the effect that the external rectus of the left eye was almost completely paralysed, the pupil did not act to light, and the disc was pale with slight haze, and it was thought that there had been direct injury to the optic nerve, possibly by fracture through the optic foramen. The appearance of the left optic disc on the twentieth day resembled that found after embolism of the central artery of the retina. The various fractures gradually consolidated. The haemorrhage from the ear was slight and the discharge which followed it of small quantity. There was no vomiting. The temperature for the first week was higher than normal, reaching from 100.8 to 102 in the evening, and being 99 or 100 in the morning; after this it was normal. The strabismus was very marked when he left the hospital, after a residence of forty-five days. The left optic disc was extremely pale, and the arteries considerably diminished in size. There were some white lines along the vessels. The right eye continued apparently normal. The man never recovered from the effects of these grave injuries, and was almost constantly under medical care for various ailments, dying at last on February 4th, 1887, from general tuberculosis. There had been no improvement in the condition of the left eye; internal strabismus and complete atrophy of the disc remained. At the *post-mortem* examination made by Dr. Hadden there was "a united fracture, evidently quite old, of the middle fossa of the skull, which extended from near the apex of the petrous bone obliquely forwards and outwards to the anterior margin of the fossa. The margins of the longitudinal fissure of the brain were pretty firmly adherent in the anterior half, and the tips of the frontal lobes were adherent to the dura mater. There were evident signs of old meningitis at the base. The pla arachnoid was thickened and opaque, especially over the optic nerves, chiasma and tracts, the crura and pons. The optic nerves were dull grey, and the chiasma and tracts distinctly changed in colour. There was no marked diminution in size. The left third nerve was greyer than the right, and more flattened. The corpora quadrigemina were normal in

size and appearance." Scattered tubercles were found in the brain. The fracture does not appear to have involved the optic foramen.

A man aged about 30 was brought to me at St. Thomas's Hospital in 1888, complaining of loss of sight in the right eye. A few months previously he had been an inmate of the hospital suffering from concussion and an injury to the right frontal region (? fracture), but had not complained of his eyesight. Mr. Lawford reported atrophy of the disc, and the eye was quite blind.

Mr. Nettleship[15] says on the subject: "But in the more common cases the accident is an injury to the head, probably causing fracture of the roof of the optic canal, with crushing of and haemorrhage into the nerve, or perhaps occasionally tearing of the nerve on the brain side of the canal. Both conditions have been shown to occur in fatal cases of fracture of the base of the skull."

Another possible cause for blindness after these injuries is the occurrence of haemorrhage into the sheaths of the optic nerves. In none of the *post-mortem* records of cases in the series here brought forward was fracture in the neighbourhood of the optic foramen found, but in either, where the damage to the base was severe, blood was found extravasated in the sheaths of the nerves. And in one at the end of eight days there was also slight neuritis. It is a remarkable fact, and one of considerable importance, that in these cases of injury to the head which I have related, and in which optic neuritis was found on ophthalmoscopic examination, if the neuritis was found in both eyes complete recovery ensued, but if after an injury to the frontal region a condition of neuritis developed in one eye only, the disc presented at a later date complete atrophy, and the patient remained permanently blind on that side. Paralysis of one or more branches of the third nerve may ensue as a consequence of injury to the head, but it was very rarely seen, the difficulty in movement presented by various ocular muscles appearing to be the result of haemorrhage, and the interference which it caused to their action, rather than to any injury to the nerves supplying them. When paralysis of the third nerve was present it was due to compression by an extravasation of blood at the base. In one fatal case in which it was not possible to get *a post-mortem* examination paralysis of the sixth nerve was noticed on admission, soon after the accident. In five patients examined; of these the injury had been very severe in all, and the squint continued without sign of improvement when they passed from observation. In one of these it was associated with optic nerve of the same side. In all a fracture of the middle fossa was diagnosed. Of the four others in whom it appeared at a later date, on the second, third, fifth, and thirteenth day, the manifestations of injury were severe, and the squint continued without improvement when last seen, with the exception of the patient in whom it appeared on the third day, and was associated with proptosis, and later with optic atrophy; in his case there was gradual improvement in the squint. It is probable that when the nerve is paralysed from the first the paralysis is due to rupture of the nerve, though a case recorded[15] does not appear to support this. In that case it is stated that the squint did not develop until three weeks after the injury, yet at the *post-mortem* examination the sixth nerve was found snapped across. One can hardly think there was no paralysis before

three weeks after the injury. Al-though in these examples the state of the nerves did not, with one exception, improve under observation, it is the experience of others that in several instances power has been gradually re-gained.

In a child, aged 3 1/2years, suffering from concussion, temporary paralysis of this nerve was observed for a period of six days, but with reference to squint in children, the statements of the mothers as to its absence before the head injury do not always agree with what is said by other relatives. There is another thing to be borne in mind, and that is the possibility of the squint being a manifestation of syphilis. An old patient of mine, who had suffered severely from tertiary manifestations some years ago, recently fell forwards accidently and struck his forehead against the mantelshelf in his room. Three days afterwards double vision gradually developed, which made it difficult for him to move about anywhere. Under iodide of potassium he recovered at the end of two months. That such a symptom as strabismus is important from the interference with vision that may follow it is well known, and as the prognosis depends much on the date of its appearance, it should be decided by the medical man when he first sees the patient whether strabismus is present or not, for the question of damages in a law court may depend much on this point, as in a case recently related to me.

Paralysis of the facial nerve is an accompaniment of many fractures of the base; indeed, like haemorrhage from the ear, it may be regarded as a most valuable sign of fracture in the middle fossa. Mr. Pick," in his remarks on some cases of fracture of the base, states that in thirteen well marked instances this symptom was present in ten, and that it developed at once in two and in a period of from two to six days in eight. It was not met with in anything like this proportion in the cases under my observation; in only fifteen was paralysis of the facial nerve sufficiently marked to attract attention, if we exclude two in which the patients were the subjects of old hemiplegia. In six the paralysis was present on admission, and persisted when the patients (four in number) who recovered were able to leave the hospital. In the two fatal cases it was found that the fracture which extended through the internal auditory meatus had produced considerable laceration of the nerves. In the others it appeared as follows: On the second day in a man aged 31, after severe haemorrhage from the ear, in whom the fracture was proved to have passed across the internal auditory meatus without lacerating the nerves. On the fourth day in a man aged 48, who recovered. On the fifth day in a man aged 29, who died from erysipelas and pyaemia. On the eighth day in a man aged 62, who died from delirium tremens. The fracture involved the internal auditory meatus, but no coarse lesion of the nerves was seen. On the tenth day in a boy aged 10. There was much oedema of the scalp and suppuration in a scalp wound at the time. The paralysis had nearly gone in a month. On the tenth day in a man aged 23, preceded by deafness the day before. The paralysis had nearly disappeared in a fortnight. On the sixteenth day in a man aged 37, with an attack of erysipelas. The haemorrhage from the ear had been very free at first. The paralysis was transient. On the eighteenth day in a man aged 40. Deafness before the accident increased during the period of haemorrhage, four days. The paralysis lasted six days, and during the time deafness was more manifest.

JOURNAL, 1885, p. 967.

2 Holmes, *A System of Surgery,* edited by Hulke, vol. i, p. 591.

s *Trans. Ophth. Soc.,* vol. ii. p. 208. *4 1bid.,* vol. *v.*

5 *Ibid.,* vol. *vii,* 1887, p. 208. See also *St. Thomas's Hospital Reports,* vol. *xi,* p. 71. *6Trans. Ophth. Soc.,* vol. *vii,* p. 212.

7 *Lancet,* vol. *i,* 1890, p. 892. *8Loc. cit.,* vol. *iii.* p. 614. *9Lancet,* vol. i, 1889, p. 424. l°*lled.-Chri. Trans.,* vol. *xiv,* p. 348.

11 *Transactions,* vol. *iii,* p. 115.

12 *St. Thomas's Hospital Reports,* vol. *ii, p.* 116.

1S See series by Messrs. Edmunds and Lawford.

14 *Vide* the *Lancet,* vol. i, p. 105, 1886; *ib.,* vol. i, p. 877, 1887.

15 *Loc. sup. cit.*

16 *Journal de l'Expirurnce,* 1843. 17JOURNAL, 1865, p. 530.

THE DIAGNOSIS OF THE INVASION OF MEASLES FROM A STUDY OF THE EXANTHEMA AS IT APPEARS ON THE BUCCAL MUCOUS MEMBRANE

HENRY KOPLIK, M.D.

Henry Koplik (1859-1927) was an American paediatrician. He was one of the founders of the American Paediatric Society. After Koplik finished medical school in New York he went on to study in Berlin, Prague, and Vienna. His finding of an early sign indicating measles was published in the *Archives of Pediatrics*, 13, pp. 918-922 in 1896. (White 2009)

It is indeed very late in the day to describe something connected with the diagnosis of the exanthemata. It will be seen from what follows that one of the most, if not the most, reliable sign of the invasion of measles has fully failed to receive due attention. My experience leads me to believe that the sign to be described is fairly ignored. This has led me to describe it here. Its importance in making a positive diagnosis of measles cannot be over-estimated. The text-books on diseases of infancy and childhood describe the appearances of the exanthema of measles both on the skin and also infragmentary ways on the mucous membranes. Scant attention is given to the most important elements of the eruption as it appears on the mucous membrane of the inside of the cheeks and on that of the lips. A thorough understanding of the eruption on the buccal mucous membrane will aid in separating an invading measles from a mass of eruptions resembling measles which appear on the skin in infancy and childhood. Any positive sign of the invasion of any infectious or contagious disease is a step to proper isolation and prophylactic hygiene.

The eruption of the exanthemata of measles on the buccal mucous membrane, its spread and decline, forms a sort of cycle which can be verified by any one who will study it. The height of the eruption is reached just as the skin eruption has appeared and is spreading. When the skin eruption of measles is at its efflorescence, the eruption on the buccal mucous membrane has begun its decline. I have looked in all the classical text-books, but fail to find any extended mention of these facts, or any minute description of the buccal eruption. Starr, in his article in the *American Text-Book,* on Diseases of Children, does not enter at all into the eruption to which I refer. J. Lewis Smith, in the edition of 1878, does not mention it. Baginsky, in his text-book, speaks of a "red spotted appearance of the pharynx," quoting Mettenheimer and Rehn. Barthez and Rilliet simply

mention a redness of the throat as preceding the eruption on the skin, quoting Heim and De-spine. Bednar makes no mention of the eruption. Osier (edition of I892), speaking of the invasion of measles says: "Examination of the throat may show a reddish hyperaemia, or in some in-stances, a distinct punctiform rash. Occasionally this spreads over the whole mucous membrane of the mouth with the exception of the tongue."

Again in the paragraph on diagnosis and differential diagnosis, the rash on the mucous membrane is not made use of in the differential tests.

Henoch describes the eruption on the mucous membrane of the mouth thus: "Before the end of the second day, you may observe, especially in robust children, on the hard and soft palate, a diffuse redness, spotted in places. More often the pale mucous membrane shows the so-called palate exanthema to a greater or less extent, punctate or star shaped red spots. These, when distinctly visible, may be considered a positive evidence of beginning measles."

There is nothing especially distinctive about the eruption in the pharynx, or on the hard or soft palate in measles. The throat, in the beginning, is reddened, the fauces, the soft palate, may be spotted, but this is also the case in many affections, such as grippe, Rotheln, catarrhal angina, and scarlet fever. In the latter the redness is diffuse, not spotted. The first twenty-four to forty-eight hours of the invasion of measles is marked by a suffusion, slight or marked, of the eyes, and the conjunctiva at the nasal canthus is not only reddened, but distinctly redundant. There is, at this stage, a slight febrile movement; there may be a cough or some little sneezing; the mother has noticed nothing except that the infant or child has a slight fever. At this period the eruption on the skin has not made its appearance. In the majority of cases there is no suggestion of any exanthema. In a few cases there is an indistinct spotting around the lips and alae nasi, but no eruption.

The Mouth

If we look in the mouth at this period, we see a redness of a fauces; perhaps, not in all cases, a few spots on the soft palate. On the buccal mucous membrane and the inside of the lips, we invariably see a distinct eruption. It consists of small, irregular spots, of a bright red color. In the centre of each spot, there is noted, in strong daylight, a minute bluish white speck. These red spots, with accompanying specks of a bluish white color, are absolutely pathognomonic of beginning measles, and when seen can be relied upon as the forerunner of the skin eruption. These bluish white specks have, I believe, been described by French writers, though the author has described them to students before he has seen mention of them elsewhere. No one, however, has to my knowledge called attention to the pathognomonic nature of these small bluish white specks, and their background of red irregular shaped spots. They cannot be mistaken for sprue, be-cause they are not as large nor as white as sprue spots. These specks of bluish white, surrounded by a red area, are seen on the buccal mucous membrane and on the inside of the lips, not on the soft or hard palate. Sometimes only a few red spots, with the central bluish

point, may exist, six or more, and in marked cases they may cover the whole inside of the buccal mucous membrane. If these bluish white specks, on a red spotted background, are at the height of their development, they never become white opaque as sprue, and in this respect, when once seen, are diagnostic, nor do they ever coalesce to become plaque like in form. They retain the punctate character. I have noted and demonstrated these spots on the buccal mucous membrane when the other symptoms were so slight that physicians have doubted the diagnosis. I have been invariably confirmed in my diagnosis by the subsequent appearance of the skin eruption.

Cycle

The eruption just described is of greatest value at the very outset of the disease, *the invasion. As* the skin eruption begins to appear and spreads, the eruption on the mucous membrane becomes diffuse, and the characters of a discrete eruption disappear and lose themselves in an intense general redness. When the skin eruption is at the efflorescence, the eruption on the buccal mucous membrane has lost the characters of a discrete spotting and has become a diffuse red background with innumerable bluish white specks scattered on its surface. The buccal eruption begins to fade even while the skin exanthema is at its height, or at least while it is running a late course. The mucous membrane retrogrades to the normal appearances long before the eruption on the skin has disappeared. This being the case, it will be seen that the buccal eruption is of greatest diagnostic value at the outset of the disease, *before* the appearance of the skin eruption and at the outset and height of the skin eruption.

Differential Diagnosis.

Scarlet Fever

The invasion of scarlet fever is marked by a more or less diffuse redness of the tonsils and pillars of the fauces. The buccal mucous membrane retains its pale normal hue.

Simple Aphthae

The appearance of red spots on the buccal mucous membrane, associated with a febrile movement, is seen often in cases ofsimple aphthous stomatitis. They are not as bright red as the spots of measles, and they do not show the bluish white specks de-scribed above, as so characteristic of the measles spots. Later on, the aphthae attain a central yellowish area, as is well-known.

Rotheln or German Measles

We often find mild forms of measles, erythemas or urticarias labelled as Rotheln. To some, Rotheln is a diagnosis much in the same line that malaria used to be before

the discovery of the plasmodium. In other words, everything mild and doubtful is called Rotheln. There is one point of great value in differentiating Rotheln and measles. In measles we invariably have the buccal eruption described above, in Rotheln the mucous membrane, lining the cheeks, has its normal pale pink hue. This is the case even when the Rotheln eruption is out on the skin and in its efflorescence. At most the tonsils and pillars of the fauces maybe a mild red in color.

Grippe

Beginning grippe with its picture of suffused conjunctivae, reddened fauces, fever and coryza, resembles very closely the invasion of measles in many cases. A distinct difference is found in the absence of the eruption described from the buccal mucous membrane. The mucous membrane, lining the cheeks, is pale and of normal hue of the outset of grippe. I have been induced to enter fully upon a description of this eruption on the mucous membrane lining the cheeks in the invasion of measles, because there are so many conditions in infancy and childhood in which the signs resemble measles. At the outset, among those which are not mentioned, we find forms of erythema or mild urticarious eruptions which are accompanied by fever and closely resemble the measles exanthema. An examination of the buccal mucous membrane, for the red spots, topped by bluish white points, will quickly rule out these puzzling cases from the category of measles. I am convinced that these spots and bluish points appear in the mouth as soon as the mother notes that the patient is ill, at the very outset of the disease. In cases where this eruption has been absent, I have always found that my exclusion of a probable attack of measles was correct. On the other hand, the cycle, described above, of the appearance, spread and fading of the buccal exanthema, is running its course, and reaches its height just as the eruption on the skin appears. This makes the buccal exanthema a corroborative sign of the character of the skin eruption.

A few words may be added, calling attention to the fact that in some cases of beginning measles, the spots on the buccal mucous membrane are so few as to escape notice, if not carefully looked for. It is, therefore, advisable in all cases, to place the patient opposite a strong light from a window, and, in opening the mouth, to evert as it were, the buccal mucous membrane with a spatula or with the thumb and index finger, pressing while on the outside of the cheeks.

66 EAST FIFTY-EIGHTH STREET,

THE ETIOLOGY OF YELLOW FEVER. A PRELIMINARY NOTE

MAJOR WALTER REED, M.D., AND
JAMES CARROLL, M.D.,
A. AGRAMONTE, M.D.,
JESSE WILLIAM LAZEAR, PH.D., M.D. ,[2]
ACTING ASSISTANT SURGEONS, U.S.A.

Walter Reed (1851-1902) was a United States Army physician. He led a team of well trained doctors that confirmed yellow fever was transmitted by mosquitoes. This ground breaking news led to the completion of the Panama Canal and launched the medical specialization of epidemiology. The team's finding was published in *The Philadelphia Medical Journal* 6: 790-796 in 1900. (White 2009)

THE writers, constituting a board of medical officers, convened "for the purpose of pursuing scientific investigations with reference to the acute infectious diseases prevalent on the Island of Cuba," arrived at our station, Columbia Barracks, Quemados, Cuba, on June 25 of the present year, and proceeded under written instructions from the Surgeon-General of the Army, to "give special attention to questions relating to the etiology and prevention of yellow fever."

Two of its members (Agramonte and Lazear) were stationed on the Island of Cuba, the former in Havana, and the latter at Columbia Barracks, and were already pursuing investigations relating to the etiology of this disease.

Fortunately for the purposes of this board, an epidemic of yellow fever was prevailing in the adjacent town of Quemados, Cuba, at the time of our arrival, thus furnishing us an opportunity for clinical observations and for bacteriologic and pathologic work. The results already obtained, we believe, warrant the publication, at this time, of a Preliminary Note. A more detailed account of our observations will be submitted to Surgeon-General Sternberg in a future report.

The first part of this Preliminary Note will deal with the results of blood-cultures during life and of cultures taken from yellow-fever cadavers; reserving for the second

part a consideration of the mosquito as instrumental in the propagation of yellow fever; with observations based on the biting of nonimmune human beings by mosquitos which had fed on patients sick with yellow fever, at various intervals prior to the biting.

In prosecuting the first part of our work, we isolated a variety of bacteria, but of this we do not purpose to speak at present. It will suffice for our purpose if we state the results as regards the finding of Bacillus icteroides, leaving the mention of other bacteria to our detailed report.

The cases studied during the Quemados epidemic had been diagnosed by the board of physicians, selected largely by reason of their familiarity with yellow fever. This board consisted of Drs. Nicolo Silverio, Manuel Herera, Eduardo Angles, and Acting Assistant Surgeon Roger P. Ames, and Jesse W. Lazear, U.S. Army.

Those studied in Havana were patients in Las Animas Hospital, and had been diagnosed as such by a board of distinguished practitioners of that city.

An examination of Table I will show the character of the attacks. The milder cases studied, few in number, were attended by jaundice and albumin in the urine.

I.

Bacillus Icteroides (Sanarelli) as the Cause of Yellow Fever. The claim of Sanarelli for the specific character of B. icteroides as the causative agent in yellow fever, has excited such wide attention, since the publication of his observations, that it seemed to us of the first importance to give our undivided attention to the isolation of this microorganism from the blood of those sick with yellow fever, and from the blood and organs of yellow-fever cadavers.

A. Cultures taken from the Blood during Life. The method followed was that ordinarily used in an attempt to isolate bacteria from the circulating blood; viz., from a vein at the bend of the elbow, a sufficient quantity of blood was taken with an hypodermic syringe, made sterile by boiling, and after careful cleansing of the skin with soap and water, followed by equal parts of absolute alcohol and ether, and 1:2000 bichlorid solution.

Exceptionally the blood withdrawn was plated on agar, but, as a rule, it was immediately transferred to sterile bouillon tubes (10 ccm.) in quantities of 0.5 ccm. to each of several tubes. These were then incubated at from 35` to 37^0 C. for a period of one week. They were examined daily and if growth was observed, plates in agar or gelatin, or both, were made and the colonies carefully studied by transferrence to ordinary laboratory media.

Eighteen cases have thus been carefully studied; of these 11 were designated as "severe" cases of yellow fever with 4 deaths; three as "well-marked" cases with no deaths, and 4 as "mild" cases with no deaths.

From these *18* cases, blood-cultures were made, as shown in the following table:

It will be seen that of 48 separate cultures made from the blood on various days of the disease and representing 115 bouillon inoculations and 18 agar plates, we failed to find Bacillus icteroides in any of our tubes or plates.

The results of cultures taken in 18' cases of unmistakable yellow fever, on various days of the disease, and in some cases on every day from the onset to death or recovery, would seem to exclude the presence of Bacillus icteroides in the blood of these cases during life.

It will, therefore, be seen that while Wasdin and Geddings, taking cultures from the ear-lobe (Report on the Cause of Yellow Fever, *1899),* record that "in the blood of yellow fever cases extracted during life Bacillus icteroides has been found in 13 of the *14* cases, with 1 negative," *(92.85%),* we, by withdrawing the blood from the veins of *19* patients, have to record 100% of failures.

We have already stated that we will reserve for a later report a description of the bacteria isolated from the blood in these cases. We now remark that but few organisms were obtained and that, as a rule, our blood-cultures gave no growth whatever.

B. *Cultures from Yellow Fever Cadavers. We* tried to obtain autopsies very soon after death, and sometimes succeeded in doing so. Tubes containing about 10 ccm. of flesh-peptone bouillon were generally used for the first inoculation direct from the blood and organs. As soon as the laboratory was reached, agar plates were made from these inoculated bouillon tubes, the former as well as the latter being then incubated at from 35^0 to 37° C. In nearly every case gelatin plates were also made from the recently inoculated bouillon tubes and kept at a temperature of 19 to 20 C.

If colonies were found in the agar or gelatin plates, on the following days, the corresponding bouillon tubes were also plated on agar and gelatin. The bacteria thus found in our plates were carefully isolated and studied upon the usual nutritive media, so as to enable us to identify them, if possible. We will here content ourselves with giving the results as regards the presence of B. icteroides only.

Our failure to isolate B. icteroides in these 11 autopsies of yellow-fever patients was a result which we had not anticipated. One of us (Agramonte), who, at Santiago, Cuba, during the epidemic of 1898, succeeded in finding B. icteroides in 33% of his autopsies, has been much surprised at the absence of this bacillus in cultures from cadavers sectioned in or near Havana, during the present year. In 2 of the 11 cases we had reason to believe that from the appearance of colonies seen in gelatin plates, we would be able to isolate B. icteroides. These colonies, however, when transferred to other media and carefully studied, did not prove to be this bacillus. We wonder whether other observers have occasionally relied upon the appearance of colonies in gelatin plates, without further study. We only mention this as a possible explanation of the large percentage of positive results recorded by some observers.

Portier, of New Orleans, La., only succeeded, however, in isolating B. icteroides in 3 out of 51 autopsies *(Journal of American Medical Association,* April 16, 1898), and, if we remember correctly, Veazie, of New Orleans, has recently reported that during

the epidemic of 1899 in New Orleans a pure culture of B. icteroides was not isolated in any case of yellow fever.

Lutz *(Revista d'Igiene e Sanita Publica,* xi, No. 13, July, 1900, pp. 474-475) says as the result of his extensive observations on yellow fever that Bacillus icteroides cannot be found by present laboratory methods in more than half of the cases of yellow fever, and that when present, the colonies are few in number. It is possible that our future autopsies may give more favorable results as regards B. icteroides.

II.

The Mosquito as the Host of the Parasite of Yellow Fever. Having failed to isolate B. icteroides, either from the blood during life, or from the blood and organs of cadavers, two courses of procedure in our further investigations appeared to be deserving of attention, viz. , first, a careful study of the intestinal flora in yellow fever in comparison with the bacteria that we might isolate from the intestinal canal of healthy individuals, in this vicinity, or of those sick with other diseases; or, secondly, to give our attention to the theory of the propagation of yellow fever by means of the mosquito a theory first advanced and ingeniously discussed by Dr. Carlos J. Finlay, of Havana, in 1881 *(Anales de la Real Academia,* vol. *xviii,* 1881, *pp.* 147-169).

We were influenced to take up the second line of investigation by reason of the well-known facts connected with the epidemiology of this disease, and, of course, by the brilliant work of Ross and the Italian observers, in connection with the theory of the propagation of malaria by the mosquito.

We were also very much impressed by the valuable observations made at Orwood and Taylor, Miss. , during the year 1898, by Surgeon Henry R. Carter, U.S. Marine-Hospital Service *(A note on the interval between infecting and secondary cases of yellow fever, etc.,* Reprint from *New Orleans Medical Journal,* May, 1890). We do not believe that sufficient importance has been accorded these painstaking and valuable data. We observe that the members of the yellow fever commission of the Liverpool School of Tropical Medicine, Drs. Durham and Meyers, to whom we had the pleasure of submitting Carter[§] observations, have been equally impressed by their importance *(British Medical Journal,* September *8,* 1900, pp. *656-7).*

The circumstances under which Carter worked were favorable for recording with considerable accuracy the interval between the time of arrival of infecting cases in isolated farmhouses and the occurrence of secondary cases in these houses. According to Carter, "the period from the first (infecting) case to the first group of cases infected, at these houses, is generally from two to three weeks."

The houses having now become infected, susceptible individuals thereafter visiting the houses for a few hours, fall sick with the disease in the usual period of incubation, 1 to 7 days.

Other observations made by us since our arrival confirmed Carter's conclusions, thus pointing as it seemed to use the presence of an intermediate host, such as the mosquito,

which having taken the parasite into its stomach, soon after the entrance of the patient into the noninfected house, was able after a certain interval to reconvey the infecting agent to other individuals, thereby converting a noninfected house into an "infected" house. This interval would appear to be from 9 to 16 days (allowing for the period of incubation), which agrees fairly closely with the time required for the passage of the malarial parasite from the stomach of the mosquito to its salivary glands.

In view of the foregoing observations we concluded to test the theory of Finlay on human beings. According to this author's observation of numerous inoculations in 90 individuals, the applications of one or two contaminated mosquitos is not dangerous, but followed in about 18%, by an attack of what he considers to be very benign yellow fever at most.

We here desire to express our sincere thanks to Dr. Finlay, who accorded us a most courteous interview and has gladly placed at our disposal his several publications relating to yellow fever, during the past 19 years; and also for ova of the variety of mosquito with which he had made his several inoculations. An important observation to be here recorded is that, according to Finlay's statement, 30 days prior to our visit, these ova had been deposited by a female just at the edge of the water in a small basin, whose contents had been allowed to slightly evaporate; so that these ova were at the time of our visit entirely above contact with the water. Notwithstanding this long interval after deposition, they were promptly converted into the larval stage, after a short period, by raising the level of the water in the basin.

With the mosquitos thus obtained we have been able to conduct our experiments. Specimens of this mosquito forwarded to Mr. L. A. Howard, Entomologist, Department of Agriculture, Washington, D. C., were kindly identified as *Culex fasciatus,* Fabr.

In this preliminary note we have not space to refer, at length, to the various interesting and valuable contributions made by Finlay to the mosquito theory for the propagation of yellow fever. In addition to the paper already quoted, his most valuable contributions to this important theory are to be found in the articles designated as follows:

> *Estadistica de las Inoculaciones con mosquitos contaminados,* etc., Reprint, Havana, 1891; *Fiebre Amarilla, Estudio Clinico Patologico y Etiologico,* Reprint, Havana, 1895; and *Yellow Fever Immunity Modes of Propagation Mosquito Theory,* 8th Congress of International Hygiene and Demography, Budapest, 1894.

His present views on this subject may be stated in his own language:

> "First, reproduction of the disease, in a mild form, within 5 to 25 days after having applied contaminated mosquitos to susceptible subjects. Second, partial or complete immunity against yellow fever obtained even when no pathogenous manifestation had followed these inoculations." *(Medical Record,* Vol. 55, No. 21, May 27, 1899.)

Without reviewing the cases regarded as mild forms by the author of this theory, we believe that he has not, as yet, succeeded in reproducing a well-marked attack of yellow fever, within the usual period of incubation of the disease, attended by albumin and jaundice, and in which all other sources of infection could be excluded.

The experiments made by us on 11 nonimmune individuals are embraced in the preceding table (III), which should be carefully studied. The mosquito used in all cases was *Culex fasciatus* Fabr.

It will be seen that we record 9 negative and 2 positive results. It is, we think, important to observe that of the 9 failures to infect, the time elapsing between the biting of the mosquito and the inoculation of the healthy subject varied in 7 cases from 2 to 8 days (Nos. 1, 2, 3, 5, 7, and 9) and in the remaining 2 from 10 to 13 days (Nos. 6 and 9).

Five individuals out of nine who failed to show any result (Nos. 2, 3, 4, 5 and 6) were inoculated by mosquitos that had bitten very mild cases of yellow fever on the fifth day of the disease, and one individual by a mosquito that had bitten a mild case of yellow fever on the seventh day of the disease. (This latter patient was discharged from the hospital three days later.) To this fact may possibly be attributed the negative results. Of the remaining three negative cases (Nos. 7, 8 and 9) and which had been inoculated by mosquitos that had bitten severe cases of the disease, the interval between the bite and the inoculation varied from 2 to 6 days.

In the two cases (Nos. 6 and 8) where the interval was respectively 10 and 13 days, the inoculations had been made with mosquitos that had bitten very mild cases of yellow fever on the fifth day of the attack. No. 8 was also bitten by a mosquito which had been infected by a severe case of yellow fever 3 days before.

We refrain from commenting further at this time upon the 9 negative cases, preferring to record the results obtained rather than to indulge in speculation.

For ourselves, we have been profoundly impressed with the mode of infection and with the results that followed the bite of the mosquito in these cases. Our results would appear to throw new light on Carter[s] observations in Mississippi, as to the period required between the introduction of the first (infecting) case and the occurrence of secondary cases of yellow fever.

Since we here, for the first time, record a case in which a typical attack of yellow fever has followed the bite of an infected mosquito, within the usual period of incubation of the disease, and in which other sources of infection can be excluded, we feel confident that the publication of these observations must excite renewed interest in the mosquito-theory of the propagation of yellow fever, as first proposed by Finlay.

From the first part of our study of yellow fever, we draw the following conclusions:

The blood taken during life from the general venous circulation, on various days of the disease, in 18 cases of yellow fever, successively studied, has given negative results as regards the presence of B. icteroides.

Cultures taken from the blood and organs of 11 yellow-fever cadavers have also proved negative as regards the presence of this bacillus.

Bacillus icteroides (Sanarelli) stands in no causative relation to yellow fever, but, when present, should be considered as a secondary invader in this disease.

From the second part of our study of yellow fever, we draw the following conclusions:

> *The mosquito serves as the intermediate host for the parasite of yellow fever, and it is highly probable that the disease is only propagated through the bite of this insect.*

NOTES

Read at the Meeting of the American Public Health Association, held in Indianapolis, Ind., October 22-26, 1900.

[2] Died of yellow fever at Camp Columbia, Cuba, September 25, 1900.

Cultures from the blood during life had been taken by Dr. Lazear in 3 other cases of yellow fever, but, owing to the death of our colleague, the necessary data as to the day of the disease on which cultures had been taken cannot be ascertained. These cultures were negative as regards the finding of Sanarelli's bacillus.

OPHTHALMOLOGY: RETRO-OCULAR NEURITIS

Robert Marcus Gunn

Marcus Gunn (1850-1909) was a Scottish ophthalmologist, zoologist, and botanist. He donated his large collection of specimens to the British Museum in London. His comprehensive work on a neurologic sign represented in the pupillary response was published in the *Lancet*, 2, p. 412, in 1904. (White 2009)

Mr. Gunn said that he should include in this category all cases which showed evidence of the optic nerve being impaired by an inflammatory affection behind the papilla. The evidence was mainly clinical and the diagnosis, for a time, might rest solely on the subjective symptoms. But ophthalmoscopic changes came to their aid, either early in the affection by the neuritis invading the papilla or after the lapse of some weeks by the optic disc becoming pale. In exceptional cases only did opportunities occur of examining the affected nerve and then nearly always long after the inflammatory stage had passed away. Put very broadly, he would include all cases in which there was evidence of the optic nerve being inflamed, apart from such as were generally recognised as papillitis. But they were confronted by two questions: (1) How were they to recognise a neuritis when the papilla presented a normal aspect? (2) How were they to differentiate between retroocular neuritis involving the papilla and a pure papillitis occur-ring without evidence of intracranial or other disease calculated to produce it? The reply must be that they were now dealing with a well-recognised clinical group of cases, associated with certain definite subjective symptoms namely, rapid failure of vision, particulary affecting the macular area, often in one eye only, usually accompanied by pain and tenderness in the orbit. Other characters were impaired pupil reaction to light, an absence of early ophthalmoscopic changes, and a tendency to recovery. Slighter or anomalous forms might occur without these symptoms or conditions as an early descending optic neuritis, from an anterior basal meningitis, would on its earlier course simulate a retro-ocular neuritis. Very similar symptoms occurred in central retinal affections and the differential diagnosis was often difficult during the early stages; the prominent symptom was central visual failure in one eye and at first there were no definite ophthalmoscopic changes. The chief distinguishing feature in the retinal cases was the absence of associated pain; there was also sometimes micropsia, or a positive scotoma, with a history of recent exposure to excessive light. They did not usually get

the late pallor of the optic disc, but frequently found oedema and round, pale, yellow spots in the macular region. In the early stages, so long as the diagnosis rested merely on subjective symptoms, retro-ocular neuritis was liable to be confused with functional amblyopia, but a careful examination of the character of the reaction of the pupil to light should always serve to distinguish between them. The reaction was invariably impaired when there was decided amblyopia from neuritis, while it remained normal in cases of functional origin. The amount of amblyopia varied greatly. There might be absolute blindness for a time in the most severe form. On the other hand, occasionally complaint was made of recent visual failure, even though the acuity was 6/6. In slight cases the test letters were read slowly, as there seemed to be a mist obscuring their outline; this was particularly evident on comparison with the other eye, for these slight forms were practically always uniocular. A relative colour scotoma at or near the fixation point could always be found in these mild cases. Visual acuity in retro-ocular neuritis was worse in a very bright light and excessive light led to further temporary deterioration, probably from the physiological degeneration so induced in the ill-nourished axis cylinders. Occasionally complaint was made of seeing objects as through a moving haze like that seen on a sunny day near the ground; this might possibly be explained by imperfect insulation of the axis cylinders, from breaking down of their medullary sheaths, a change which was known to occur early in retro-ocular neuritis. Besides loss of visual acuity there was a marked diminution in the light sense. A feature of retro-ocular neuritis was the rapidity of the visual failure; this was in contrast with the length of time that a papillitis might exist without the nerve function being affected, and with the usually gradual failure when it did occur in the latter. The visual failure in retro-ocular neuritis very frequently took the form of an absolute central scotoma, surrounded by an area in which the colours red and green were recognised imperfectly or not at all. This visual loss was due undoubtedly to interference with the conducting efficiency of the macular fibres, which from their predominance, both in size and action, and probably by reason of their nourishment by peripheral blood-vessels (Silcox) were liable to degenerations not so easily affecting the general mass of the optic nerve fibres. Pain was a feature of the condition; it was marked in one-third of the cases collected. It was either referred to the back of the eyeball or was elicited on pressing the globe backwards. It sometimes preceded alterations in visual acuity. Lastly, there was much more tendency to recovery, even in severe forms of retro-ocular neuritis, than would be expected, judging from experience of other optic nerve lesions. At the same time there were exceptional cases in which no recovery took place, and others where there was a liability to recurrence so that ultimately the visual result was disappointing. On such important points of etiology as the relation of age and sex to the disorder he had made careful examination in the 350 cases which he had collected. Etiology was varied and often obscure. Toxic amblyopias proper, as from tobacco, he excluded from the group under review. In one class he included inflammation communicated to the nerve from neighbouring structures. Cellulitis or periostitis in the orbit, accounted for 40 cases; exposure to cold for 27; inflammation secondary to dental abscesses for 17; and sphenoidal sinus disease for

18. In a second class he put local manifestations of general disease; syphilitic disease (gumma), 16; and insular sclerosis, a large group of 51 cases. A third class included neuritic cases of toxic origin, chief among which ranked influenza with 27 cases; next gout, 22; and blood disorders, malaria, constipation, ptomaine poisoning, mental or traumatic shock, &c., 68. Whilst in no less than 55 cases the causation was obscure. In regard to sex and age, on the average of all cases men were slightly more affected than women 37 as against 31 ratio, but in primary cases the females were decidedly predominant, particularly in the decade from 20 to 30 years. In this period alone there were 77 primary cases, of which 48 were in women and 29 were in men. After the age of 40 years men were more affected. The differences, he thought, were accounted for by the greater risks of females during the period of pronounced sexual activity, and of men in later years from shock, gout, and arterial disease.

THE TRANSMISSION OF ROCKY MOUNTAIN SPOTTED FEVER BY THE BITE OF THE WOOD-TICK (DERMACENTOROCCIDENTALIS)

Howard Taylor Ricketts, M.D.

Howard Ricketts (1871-1910) was an American pathologist. His theory was tick transmission was responsible for Rocky Mountain spotted fever. Such a dedicated researcher, he injected himself several times with a pathogen in order to measure its effects. He is honored by having the *Rickettsiaceae* family of bacteria named after him. His account was published in the *Journal of the American Medical Association*, August 4, p. 358, in 1906. (White 2009)

IN THE JOURNAL, July 7, I reported briefly my success in transmitting Rocky Mountain spotted fever to the guinea-pig and monkey. With these results in hand, it at once became apparent that a means had been provided by which to test the theory of transmission by the wood-tick, a theory which was primarily advanced by Wilson and Chowning. It was my first aim to establish, beyond the opportunity of doubt, the susceptibility of the animals mentioned, and it was only after this susceptibility had been determined by inoculation from two different patients that the study of the tick as an intermediate host for the parasite was taken up.

On June 19 a small female tick was placed at the base of the ear of "Bradley" Guinea-pig 1. This guinea-pig had been inoculated intraperitoneally on June 11 with three cubic cm. of defibrinated blood from the patient, Bradley, and died with characteristic symptoms on June 23. After having fed on the infected guinea-pig for two days, the tick was removed, placed in a ventilated pill-box for two days more, and on June 23 was attached to the base of the ear of a female guinea-pig weighing 300 grams. After an incubation period of three and one-half days, the temperature of the animal rose to 104.2, gradually ascended to 106.4, near which point it remained for seven days, when it gradually returned to normal. The bite of the tick in this instance seemed to be very virulent, the whole ear becoming very much swollen, indurated and cyanotic, and a slough almost one-half inch in diameter, which developed in the vicinity of the bite, eventually separated.

The animal exhibited the following course of fever:

June 23, a.m., 102.3; p.m. 102.2	July 1, a.m., 104.6.
June 24, a.m., 101.9	July 2, a.m., 105.2.

June 25, a.m., 102.8; p.m., 103.9.
June 26, a.m., 102.4; p.m., 103.6.
June 27, a.m., 102.5; p.m., 104.2.
June 28, a.m., 106.4; p.m. 105.2.
June 29, a.m., 105.6; p.m., 105.8.
June 30, a.m., 104.8; p.m., 106.1.
July 3, a.m., 104.7; p.m., 105.
July 4, a.m., 104.7; p.m., 103.1.
July 5, a.m., 103.8; p.m., 103.9.
July 6, a.m., 103.4; p.m., 103.5.
July 7, a.m., 102.5.
Recovery.

Seven days after inoculation, the external genitalia became swollen and congested, and this condition became more marked until the twelfth day, when it began to subside. At no time were distinct hemorrhages in the genitalia or other parts of the skin to be seen. The course of the disease was exactly similar to that seen in a number of other guinea-pigs which ran a severe course, with eventual recovery. The absence of a hemorrhagic condition in the skin, or of a discover-able roseolar erupton, throws no doubt on the success of the transf ission, since, as shown by other experiments, a perceptible eruption does not appear invariably in spotted fever as it is produced in the guinea-pig experimentally.

It was not possible to attempt the transmission of the disease from this animal to others, because of the lack of guinea-pigs at the time.

As controls I have two experiments in which uninfected ticks fed on normal guinea-pigs without causing a rise in temperature; further-more, two guinea-pigs, which lived for two weeks in the box occupied by the infected animal showed no abnormal temperature, a fact which argues against the transmission of the infection by mere association with excretions of infected animals.

The result of this experiment brought very forcibly to my mind the probable part which the tick plays in the infection of man and shows the necessity of repetition of the work with a more abundant material. In view of the result which I had obtained I was not surprised to note the recent report of Dr. King' of the U. S. Public Health and Marine-Hospital Service, who starting with material which I had given him, accomplished transmission in the same manner.

Hasty conclusions as to the question of tick transmission in relation to the infection of man are, by all means, to be avoided until such a time as the experiments can be repeated and the life history of the infection worked out more thoroughly. This phase of the subject, in common with others, is being studied by me, the infection still being maintained in animals for these purposes. It is hoped that some of these questions may be settled satisfactorily before the advent of the disease next year. At all events the knowledge so far gained may well be taken into account in instituting prophylactic measures against the disease.

NOTES

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CHRONIC INFECTIOUS ENDOCARDITIS

Sir William Osler, 1st Baronet, M.D.

William Osler (1849-1919) was a remarkable physician and historian. He was considered by many to be the Father of Modern Medicine, though he felt that honorary title should belong to Avicenna the 10th century Persian physician. His textbook *The Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine* published in 1892 secured his role as the world's leading authority in the teaching of modern medicine. Presented here is another example of the immortal William Osler's clinical observations as published in the *Quarterly Journal of Medicine*, in 1909. (White 2009)

An endocarditis with fever as its only symptom may be prolonged for weeks or months under many different circumstances. Following rheumatic fever in a child an endocardial complication may keep up a temperature of from 100 to 101 for several months, during which time there may be no other symptoms and the general condition may remain fairly good. In chronic valvular disease in the stage of broken compensation slight irregular fever may persist for months, associated with the presence of fresh endocarditis. As a rule, the form of endocarditis to which we give the term infective, septic, or ulcerative runs its course under three months. That occasional instances were characterized by a very protracted course was noted by Wilks, Bristowe, Coupland, and Lancereaux. In my Goulstonian Lectures, 1885, I stated that this type had the following characteristics: the fever was irregular and intermittent, resembling ague; the cold, hot, and sweating stages might succeed each other with great regularity; in the intervals fever might be absent; two or three paroxysms could occur in the course of a day. In many of the instances the disease was prolonged to three or four months, and I give the notes of a case of Bristowe's, in which the condition persisted for five months. The recurring chills usually led to the diagnosis of malaria and also gave rise to the opinion widely held, particularly by French writers, that ulcerative endocarditis could be caused by this disease. The cases to which I wish to call attention in this communication are of this chronic character, not marked specially by chills, but by a protracted fever, often not very high but from four to twelve months' duration. At the time of the delivery of the Goulstonian Lectures I had not seen a case of this type. In the past twenty years I have seen ten cases of this form, two of which I have already reported *(Practitioner, 1893). I* have put them together in tabular form to indicate their main features.

It has long been recognized that malignant endocarditis is really an acute septicaemia with localization on the endocardium, but the symptoms are not necessarily due to the local lesion. The clinical picture is a septicaemia sometimes of a typhoid type, sometimes like a pyaemia then again with predominant meningeal symptoms, occasionally with pronounced cardiac features. The pneumococcic, the gonorrheal, and the streptococcic forms present, as a rule, a picture in which the heart-symptoms are in the background. Cases of infection with these organisms may run an identical course without any endocarditis. On the other hand, there is a large group of cases in which the endocarditis plays a more important role and the vegetations and ulcerations appear to be directly responsible for the fever and the associated symptoms. As a rule, the valves involved are already the seat of a sclerotic change. The source of the infection is rarely to be determined. Thus, in only one of the series here reported was there an external lesion. The patients in this series were all adults, five women and five men. In six there was a past history of rheumatic fever; eight had old mitral lesions, two aortic, well compensated, and not giving any trouble at the time of the onset of the symptoms. It was not always possible to get a definite history of how the attacks began. In five of the cases there were chills and fever, mistaken for malaria. Cough and loss of weight in some cases suggested tuberculosis. The slight fever without any localizing symptoms may raise the suspicion of typhoid fever. In my series these have been the three diseases the diagnosis of which has been suggested. Once established the fever becomes the dominant, and for months may be the only, symptom. This is the most striking peculiarity of the cases. Week after week, month after month, the daily rise of one and a half or two degrees may be the only indication there is of an existing mischief. In Case I, in which the fever lasted for thirteen months, the patient's sister, a trained nurse, had decorated the room with yards of the temperature charts; fever with an occasional sweat were the only symptoms. The appetite remained good and she lost very little in weight. There were no embolic features and from month to month there were few, if any, changes in the cardiac condition. In this very protracted form chills are not nearly so common as in the more acute cases, nor is the fever so high, not often reaching above 102.5 or 103. It is of a remittent type, not falling to normal at any period of the day. With the occurrence of a chill the temperature may rise to 104 or 105 , but in none of the cases was there the type of fever in which the paroxysms recur with great regularity quotidian or tertian, as we see so often in the acute forms of ulcerative endocarditis. Another peculiarity is the occurrence of periods of apyrexia, usually towards the end, but in one or two of the cases there were afebrile interludes which gave deceptive promise of recovery. It is well recognized now that fever is not an invariable accompaniment of endocarditis. Following pneumonia there may be for months a slight toxaemia with little or no fever in connexion with a patch of endocarditis.

The cardiac features in this group are usually well marked, but as a rule there are no symptoms. The patients complain neither of palpitation nor of pain. There is no dyspnoea except towards the close, and in no case did dropsy occur. In eight of the ten cases there were the well-marked physical signs of a mitral lesion and the associated

slight enlargement of the heart. In only six cases was there marked hypertrophy and dilatation. In two of the cases there was aortic insufficiency. One of the most striking circumstances is the very slight change in the character of the heart murmur in spite of the fact of most extensive vegetations and alterations in the valves. Thus in the case of Dr. R. T., with the condition of whose heart I had been famiiiar for fourteen years, the comparison between my first examination in 1889 and that in 1893 showed very little change beyond the slightly greater dislocation outwards of the apex beat. In several of the cases the absence of any change in the character of the heart murmur and the remarkably quiet, negative state of the organ were urged strongly against the existence of endocarditis. It is rather remark-able, considering the anatomical changes, that so little alteration may occur in the physical signs. In Case VI, Dr. B. T., the murmur of aortic insufficiency became more intense towards the close, but in no instance was there the development under observation of alterations in the physical signs such as are sometimes seen in acute ulcerative endocarditis.

Embolism, to cause symptoms, occurred in four cases of the series in Cases III, IV, and IX in the brain with haemiplegia, Case VIII in the retinal arteries and in the spleen and kidneys. This is in striking contrast to the frequency of this complication in the more acute types of endocarditis.

One of the most interesting features of the disease and one to which very little attention has been paid is the occurrence of ephemeral spots of a painful nodular erythema, chiefly in the skin of the hands and feet, the *nodosites cutanees ephemeres* of the French. My attention was first called to these in the patient of Dr. Mullen of Hamilton, whose description is admirable: `The spots came out at intervals as small swollen areas, some the size of a pea, others a centimetre and a half in diameter, raised, red, with a whitish point in the centre. I have known them to pass away in the few hours, but more commonly they last for a day, or even longer. The commonest situation is near the tip of the finger, which may be slightly swollen.' Spots of this character occurred in seven of the cases and in three at least they were of importance in deter-mining the diagnosis. Thus in the case of Dr. Carroll, the well-known American Army Surgeon, the collaborator with Dr. Reid in the brilliant work upon yellow fever, the presence of these spots appeared to me to clinch the diagnosis. They are not beneath but in the skin and they are not unlike an ordinary wheal of uticaria. The pads of the fingers and toes, the thenar and hyperthenar eminences, the sides of the fingers, and the skin of the lower part of the arm are the most common localities. In one case they were present in the skin of the flank. I have never seen them haemorrhagic, but always erythematous, sometimes of a very vivid pink hue, with a slightly opaque centre.

The diagnosis in this group of cases may offer great difficulties. For weeks, indeed for several months, there may be only fever, and unless there have been special features pointing to the heart, such as the development of a diastolic murmur or the great intensification of a mitral bruit, it may be impossible to settle the diagnosis. There are, indeed, cases in which from beginning to close no heart murmur has been present. By far the most suggestive features are: (1) a knowledge of the existence of

an old valve lesion. This was present in every one of my series. (2) The occurrence of embolic features, sudden swelling of the spleen, with friction in the left flank, sudden attack of haematuria, embolism of the retinal arteries, hemiplegia or the blocking of a vessel in one of the limbs. (3) The onset of special skin symptoms, purpura, and more particularly the painful erythematous nodules to which I have referred. Present in seven of the ten cases, these are of definite diagnostic import. They are in all probability caused by minute emboli. (4) The progressive cardiac changes, the gradual increase in the dilatation of the heart, the marked change in the character of a mitral murmur, the onset of a loud rasping tricuspid murmur, or the development under observation of an aortic diastolic bruit.

With carefully made blood-cultures one should now be able to determine the presence of the septicaemia. This was easily done in three of my more recent cases. An onset with chills and fever and slight swelling of the spleen almost always leads to the diagnosis of malaria, more particularly in regions in which this disease prevails, but in not one of my cases was there any difficulty in excluding this by careful microscopical examination of the blood. It was not always possible to convince the physician. With slight cough tuberculosis may be suspected, as happened in two or three cases of my series. For many weeks the patient may present nothing but a pyrexia, of doubtful origin, or a cryptogenetic septicaemia, and as he may look very well and may feel very well, and there are no special symptoms, and with a heart-condition that may have remained unchanged for years, it is not easy to reach a positive diagnosis. The blood-cultures and the presence of the painful erythematous nodules and the occurrence of embolism furnish the most important aids.

The anatomical condition in these cases in quite unlike that of the ordinary ulcerative endocarditis. In the three specimens I have had an opportunity of studying there was no actual ulceration, but large proliferative vegetations, firm and hard, greyish yellow in colour, projected from the endocardium of the valves like large condylomata, encrusting the chordae tendinae and extending to the endocardium of the auricle. The condition is quite unlike the globose vegetations of the pneumococcal and gonorrhoeal endocarditis or the superficial ulcerative erosions of the acute septic cases.

The organisms responsible for this condition have been care-fully studied. In my series cultures were made in six cases. In three they were negative. In two streptococci were present, in one a staphylococcus. While, as a rule, this condition is much more commonly caused by the streptococcus other organisms may be present. Thus Fraenkel has reported one instance of a pneumococcus endocarditis persisting for nearly six months *(Deutsche med. Woch.,* 1900). Of sixteen cases of this chronic form, the clinical course of which extended from four to eight months, Harbitz *(Deutsche med. Woch.,* 1899) found pneumococci in four, streptococci in nine, and in eight other micro-organisms. Lenhartz *(Deutsche med. Woch.,* 1901), who has reported sixteen cases with a duration of from three to seven months, found staphylococci and streptococci the common organisms, the pneumococcus once and the gonococcus once. In the majority of cases it seems to be a mild streptococcus infection, possibly by a special form. Possibly in some instances

there may be a special resistance on the part of the host, but these are points which must be settled by future investigations. These are cases in which the possibility of successful vaccine treatment should be considered. It was tried in two cases of my series, but in both rather late, and in neither did it seem to have special influence. Horder has treated a case of this chronic type with a vaccine prepared from the patient's organism, but without success. The results in the acute forms are discussed by him in the *Practitioner,* May, 1908. Abstracts of the cases are here given.

Case I

J. M., aged 28. I saw this patient with Dr. Mullen of Hamilton, Ontario, in 1888; during my occasional visits to that town, on my way to Toronto. A point of special interest is that the sister of the patient, a trained nurse, had kept a very accurate temperature chart from July 17, 1888, to July 7, 1889, nearly twelve months. Sheets of the four-hourly temperature charts, pinned up on the wall of the bedroom, provided a very remarkable picture.

The patient had had good general health, but at twelve years of age had had rheumatic fever. In February, 1888, she got cold and had pain in the chest. Early in the summer she began to feel badly and had attacks of faintness and the fever came on in the after-noon. When she returned to her home in the first week of July the temperature was as high as 104 in the evening, and she was thought to have typhoid fever. The fever persisted and she had profuse sweats. I saw her in the end of September, and though a systolic murmur was present I did not appreciate that the condition was one of endocarditis. I saw her again at Christmas time, when she seemed very much the same, except that she had been having severe rigors followed by very high fever and profuse sweating. This was the first case in which I noticed the remarkable skin lesions. She had a great many crops which were at first thought to be urticaria. Dr. Mullen's description is most characteristic: `The spots continue to appear at intervals. They are erythematous, some as small as a pea, others a centimetre and a half in diameter with white point in the centre. They often pass away in the few hours and rarely last longer than the evening of the day on which they appear. They are not numerous. The commonest situation is near the tips of the fingers, which for a short time become swollen.' These spots were seen more or less throughout the illness, less towards the close than at the early part. At this visit at Christmas we made up our minds that the condition was one of endocarditis. The heart murmur had intensified and there were signs of dilatation of the organ. I saw her again in April, 1889, when there was little or no change, except that she was weaker. She died July 7, 1889, more than thirteen months from the onset of the illness. Dr. Mullen very kindly sent me the heart for dissection. The mitral valves were a little thickened; the orifice admitted two fingers. The margins on the auricular side were covered with large vegetations, many of them extending on to the wall of the left auricle. The chordae tendinae were shortened and thickened and encrusted with vegetations. There were signs of old infarcts in the spleen and kidneys.

Case II.

T. B., aged 43, admitted to the private ward, Johns Hopkins Hospital, March 13, 1892, complaining of weakness and fever. He had had very good health, with the exception of an attack of typhoid fever twenty years previously and chronic malaria when a lad. Early in December, 1901, he began to have loss of appetite, malaise, and fever with enlargement of the spleen. The fever was of an intermittent type, ranging from 102 to 103. He had occasional sweats. The spleen was enlarged, and very naturally the condition was thought to be malaria. Throughout the winter the temperature persisted and he had cough, and there was a loud systolic murmur detected at the apex. When admitted to hospital the examination was everywhere negative, except in the heart, the impulse of which was in the sixth interspace, three centimetres outside the nipple line. There was a loud systolic murmur of a musical quality heard as far as the angle of the scapula. The sounds at the aortic cartilage were clear. There was no anaemia. The patient was under observation from March 15 to May 10. The temperature rose daily to between 102 and 103 ; about four or five o'clock in the afternoon he sweated. He gained slightly in weight. He complained a little of pain on the left side in the splenic region. Throughout May and June the temperature range was from 97 to 103. In July the fever was less marked. There were several days when the temperature was almost normal. Early in July for the first time the petechiae appeared. At intervals there were very profuse sweats. Throughout August and September there were groups of days in which the temperature was normal or subnormal, sometimes as low as 95. He died September 16, about ten months from the onset of his illness. The autopsy by Dr. Block showed an extensive mitral disease. The ventricular surfaces of the valves were studded with enormous masses of vegetation. The chordae tendinae were thickened and encrusted with firm yellow outgrowths. The aortic valves and those of the right side were normal. The spleen and kidney showed infarcts.

Case III

Florence M. D., aged 21, seen March 16, 1899. The patient was well and strong as a girl; at seventeen she had severe anaemia. Through the summer she was very well, but tired easily on exertion. In October she began to have feelings of chilliness and irregular fever, and sometimes the joints were a little stiff and sore, but never red. The doctor thought she had slight rheumatic trouble and gave her salicylates, but she never got perfectly well and grew pale and nervous. She had a little cough and it was suggested that she might have tuberculosis. Early in February she had a severe chill. Subsequently she had slight ones at intervals, following which the temperature would rise to 103. It was then discovered for the first time that she had heart trouble. As she had a cough as well, it was decided to send her South and she was brought to see me on the way through Baltimore.

She was a tall, well-nourished girl, looking a little pale. I was surprised to find the temperature above 103. The pulse was rapid. The heart's action was violent, the apex

beat in the fifth space outside the nipple line. There was a very intense apical systolic murmur, transmitted loudly to the back and also heard in the left sternal margin. There was a soft bruit at the aortic cartilage. There was no swelling of the joints, but on the radial side of the first phalanx of the right index finger were three raised red spots, each about a centimetre in diameter and very tender. They appeared that day, and she stated that they came at various places on her hands and feet and lasted two or three days. The patient was so ill that they were not able to proceed on their journey, and I saw her at intervals for the next six weeks. Symptoms of severe endocarditis increased. Early in April she had left hemiplegia and the spleen enlarged. Numerous crops of the painful spots of the skin came out, four or five at a time, usually about the hands and feet, occasionally in the forearms and legs. She could tell at once when a fresh one started because of a peculiar hot and tingling sensation. Then it grew red, became swollen and very tender. After lasting from twenty-four to thirty-six hours they gradually faded. They were not specially connected with the tendons. They were in the skin and perhaps a larger number occurred in the palmar surfaces of the hands, particularly about the pads of the fingers. She died April 25, between seven and eight months from the onset of the illness. There was no post mortem.

Case IV

Mary B., aged 19, seen with Dr. J. K. Mitchell of Philadelphia, June 16, 1890. The patient had had rheumatic fever as a child but had got fairly well and strong. Her illness began with chills and fever which were thought to be malarial, but no parasites could be found in her blood. When I saw her there were signs of an old mitral lesion apex beat outside the nipple, impulse forceable, and a loud systolic murmur propagated to the back. The spleen was enlarged. The temperature ranged from 102 to 103 and she had profuse sweats. Crops of painful spots appeared from time to time upon the hands and feet, and a few on the skin of the flanks. This was the second case in which I had seen them. They were red, raised, from 3 to 5 mm. in diameter, and often very painful. The fever in this case lasted about seven months. Towards the end embolic symptoms occurred, with hemiplegia.

Case V

July 16, 1902, I saw with Dr. Samuel Ward of Albany, Mr. B., of Cincinnati. I had seen Mr. B. about for several days and noticed that he was not looking very well, but was surprised to find on examining him that he had an old heart lesion, well-marked aortic insufficiency, a loud aortic systolic murmur, and a rough murmur of mitral regurgitation. The patient stated that he had been having malarial fever since the end of May. He had been subject to the disease since 1879. In 1884 he had typhoid fever. He had had attacks of arthritis which were called gout, in one of which in 1898 he had some affection of the heart. The attack at the end of May did not yield to the usual remedies of quinine

and Warburg's tincture, and early in June he had a severe chill followed by fever and sweats. He had been up and about, but he had had fever ever since, the temperature occasionally rising to 103.

From the outset I had no doubt of the nature of the trouble, and had no belief in the malarial theory of the fever, though he came from a malarial district and he had had attacks. Under these circumstances it is always possible to have malarial complications, but there were no crescents in the blood and no pigmented leucocytes. Dr. Ward ascertained that in the second week of April he had bruised his foot on one side, which became red and inflamed, and hot poultices had to be applied. He was in bed for four days. It is quite possible that this may have been a local focus of infection. I saw the patient at intervals with Dr. Ward through August. He had three severe chills. The temperature became more irregular and reached a higher point. He was removed to his home at Cincinnati under the care of Dr. R. W. Stewart. A pure culture of staphylococcus aureus was obtained from the blood. There were no embolic features. He died September 16, 1902, about four months from the onset of the fever.

Case VI

Dr. B. T., aged 33, seen September 25, 1902. Early in May while hard at work he began to have fever. As he had been to the eastern shore of Maryland, it was thought to be malaria. Once or twice a week his temperature would rise to 101 or 102 , some-times with a chill. He lost in weight, but was able to continue work, and in July while away for a holiday he seemed better, though he still had occasional attacks of fever and sweats. For the previous six weeks he had had daily temperature from 100 to 101 and had sweated at night. Occasionally he would feel very cold and at night when getting into bed the teeth would chatter. He had consulted one or two professional friends who thought he possibly had chronic malaria, and pulmonary tuberculosis was suggested. He had become a little thinner and paler.

He had been a remarkably healthy man with a very good family history. He never had had rheumatic fever or chorea. He had not had gonorrhoea. On close questioning he stated that in April or May, he forgot which, he had little swelling and tenderness in some of the joints, but it was quite trifling. In 1890 in an examination for Life Insurance Dr. Chew found aortic insufficiency, but he had never had the slightest cardiac inconvenience.

The patient was a very well-built, well-nourished man, looking a little pale. The right wrist-joint was a little tender on pressure, there were no subcutaneous fibroid nodules. There was a well-marked collapsing pulse. The apex beat was outside the nipple line, not forcible. There was a little diffuse pulsation to right of sternum and second interspace. At the apex the heart-sounds were flapping and clear. At the second right intercostal space there was a short, rough systolic, and a well-marked diastolic murmur of slightly wiry quality was heard down the sternum. The spleen was not enlarged. The patellar tendons on either side were tender on pressure. He assured me that the heart features were very

much like those which Dr. Chew had noted in 1900, and I felt convinced that the case was one of endocarditis. Throughout October he became worse and was confined to bed. On November 26, when I saw him, he had changed remarkably. He was very pale. Visible pulsation was seen everywhere in the smaller vessels. The spleen was enlarged. The heart had become more dilated, but there was very little change in the murmurs, except that there was now a loud apical systolic. He had had several very painful spots about his fingers and toes, lasting for a day or two. The blood-cultures were negative. I saw him again on December 8, and he was much worse. His feet were oedematous, with petechial spots here and there. He died in January, about eight months from the onset of the fever.

Case VII

Dr. R. H. T. In 1889 and again in 1890 I was consulted by Dr. T. for an old mitral lesion which was associated with slight enlargement of the left ventricle. As a boy he had had a mild attack of rheumatic fever. For the next ten or twelve years I saw Dr. T. at intervals and never found any special change in his heart. He was a man who lived a very active life and was able to do a great deal of work, though with limitations. During the year 1903 he was not very well and throughout February he had an irregular fever, never very high, not often reaching 102. He felt very well and he had no chills. From early in March until his death, October 3 (eight months), he was confined to bed and was under the care of Dr. H. B. Thomas, to whom I am indebted for the copy of the temperature chart. I saw him at intervals. Briefly summarized, the main features were, first, fever, which rarely rode above 102. After June it became a little higher and a little more irregular and sometimes reached 103. In August and September it was lower, and after September 17 until his death it was normal. There were no chills. He had occasional sweats.

The condition of the heart was very interesting. In June and July when I saw him the pulse was good, heart's action regular, and there was very little change in the mitral murmur, which presented practically the same characteristics with which I had been familiar since 1889. He had no cardiac distress, as a rule, but just before he was moved in the summer there were two attacks of what were supposed to be angina.

The only embolic features were two attacks in the vessels of the retina in July. He had no painful spots on the skin, but he had painful fingers. On one of my visits he had a well-marked, localized red spot about three millimetres in extent on the pad of one finger. He died suddenly October 3, after an illness of more than eight months. The post mortem, by Dr. MacCallum, gave the following: vegetative and ulcerative endocarditis affecting tricuspid, mitral, and aortic valves and wall of left auricle; rupture of chordae tendinae and encrustation with vegetations; embolic occlusion of anterior coronary artery at orifice; embolic necrosis of myocardium, cardiac hypertrophy and dilatation; infractions of various ages in the spleen and kidney; focal haemorrhages in the intestines; acute splenic tumour; the vegetations everywhere were firm, yellowish white, and from

the mitral orifice a great mass projected into the auricle and there were large irregular masses on the aortic valves. The cultures showed a streptococcus.

Case VIII

In November, 1906, I saw with Dr. Fuller England in Winches-ter Mr. W., aged 36. He had been under the doctor's care many years previously for acute rheumatism which had left his heart damaged. There was a loud mitral systolic, but there was perfect compensation. Through the summer of 1906 he was not very well and complained of shortness of breath, and in July had frequent attacks of shivering. He began to have inability to rest comfort-ably at night in the recumbent posture. He lost in weight and became anaemic. He had also slight fever. When I saw him he had been for some weeks in a nursing home. His temperature had ranged from 100^0 to 101.5^0 It was very frequently subnormal in the morning. He had profuse sweats. There was some little doubt at first in the diagnosis, as he had tenderness in the region of the spleen and a dilated stomach. There was a history of tuberculosis in his family.

The patient was very pale and looked thin and ill. There were the signs of old mitral disease with moderate hypertrophy of the heart, a loud thrill and a very intense apical systolic murmur. There was slight infiltration of the bases of both lungs. The spleen was enlarged, but at the time of my visit there were no embolic features. Cultures were made from the blood and a streptococcus was obtained. Numerous injections of a polyvalent serum were made which seem to have reduced the fever slightly, and it caused a good deal of drowsiness. For a month before his death there were numerous embolic patches on the skin with purpura. The patient lingered until December 8. The temperature chart is very interesting. The fever was never high, not once passing above 102. Towards the end, for the month before his death, it was rarely above 100. Anti-streptococcic serum seemed to have reduced the fever very much.

The entire duration was about six months. A point of interest in the diagnosis is that the case began with symptoms of shivering, sometimes a definite chill, and as he had an enlarged spleen it was suggested at first he had malaria. Then the distension of his stomach and indefinite swelling in the left side of the abdomen aroused the suspicion of cancer. L ter, a slight cough, the fever, the infiltration of both bases, and the man's general appearance suggested tuberculosis.

Case XI

May 8, 1907. I saw in Washington, with Dr. Hardin, Dr. J. C., aged 52, well known in connexion with his work on yellow fever. He had had the ordinary diseases of childhood, typhoid fever in 1886, yellow fever in 1900. He passed the physical examination for the Army in 1902. For several years he had known that there was a lesion of the mitral valve which was detected in a Life Insurance examination. On the evening of February 18 he felt chilly and did not rest well. The next forty-eight hours he was depressed, had

cough, and his temperature rose to 102.8. From that time until the day I saw him he had had regular fever, rarely reaching above 102.5. He had sweats, more particularly in the early morning hours. As he had a little cough and had lost in weight, it was very natural that tuberculosis was suspected. Dr. Ruffin, Dr. Thayer, Dr. Barker, and others saw him and it did not seem possible to arrive at a satisfactory diagnosis, as the physical signs were so slight and there was nothing but the fever.

He looked very well, not specially changed in appearance since I had last seen him. There was no alteration in the skin. I made a careful examination, which was negative everywhere except the heart. There was slight enlargement of the left ventricle and there was an apical systolic murmur propagated beyond the mid axilla, and there was a loud pulmonic second sound. His physicians could not determine that there had been any special change in the condition of the heart or in the murmur. He complained of very peculiar spots on his skin, chiefly about the arms and fingers, sometimes on the toes and feet. They came in crops, lasting from one to five days. Each spot was raised, a little red, and felt like a localized infiltration of the skin. They were chiefly on the fingers and on the palms of the hands, sometimes along the forearm. When I saw him, two or three were just disappearing. I did not think that there was any question as to the nature of the case. The mitral lesion, the irregular, persistent fever, and the spots suggested strongly the chronic septic endocarditis. Throughout the summer the condition remained practically the same. The fever persisted, the oscillations of temperature a little greater; he continued to have occasional eruptions of the spots on his fingers, the crops lasting for two or three days. There were no other signs, no audible change in the heart lesion. On September 15, 1907, he suddenly lost power of speech and got right hemiplegia, and he died in fourteen hours. About fifteen blood cultures were taken, all negative. The duration of this case was exactly seven months.

Case X

January 13, 1908. I saw, with Dr. Ward and Dr. Powel of Southampton, Alice A., aged 20. Five years previously she had rheumatic fever, a severe attack with cardiac complications and very slow recovery. Twelve years previously she had a very deep-seated gland removed from the right side of the neck. It was probably tuberculous. The hypoglossal nerve was involved and it had left her with atrophy of one side of the tongue. The previous winter she `came out' and had a very busy season. She danced and skated and seemed very well. In February she had tonsilitis, not a very severe attack, but she had not been quite well since. She was pale and was often weak and nervous. This was attributed by her mother and the doctor to a love affair which had worried her. Some weeks later she began to have a slight fever and the doctor at first suspected that she might have tuberculosis, but the lungs were negative. Then through the summer she was not well, and on and off had febrile attacks, which increased in September. In October it was thought best that she and her mother should go abroad and spend the winter. On the steamer she got very much worse and it was found she had a temperature of 103

She landed about the end of October and had been in a nursing home ever since. The symptoms had been (1) Fever, which had ranged from 100 to 102 , only within the past week had it crossed the 103 limit; (2) she had had at times drenching sweats so that the bed-clothes had had to be changed; (3) she had lately had great irritability of the stomach, constant nausea; (4) on several occasions on the tips of the fingers there had appeared red spots, exceedingly tender swellings, looking very angry and almost, as Dr. Ward said, as though they would suppurate and then they gradually subsided.

There was no pain and no distress about the heart; the urine was clear; the sputum had been examined, as, of course, tuberculosis was at first suspected. She had wasted a good deal. I founda girl looking a little pale, but not so thin in the face as in the body. There was marked general anaemia of the skin, much more so than the face would indicate. The pulse was small, about 110. There were no petechiae. The heart was moderately enlarged, the impulse forcible, wavy, and extended from the second interspace to the fifth, an inch outside nipple line. There was a very intense mitral systolic heard everywhere over the heart, loudly up the left sternal margin and transmitted to the spine. Though rough and harsh, Dr. Ward did not think it had specially changed in character. The second sound was everywhere clear.

Within three or four days there had been a slight infiltration at the lower lobe of the left lung. The percussion note was impaired and the breath sounds tubular. The apices and other parts were clear. The abdomen was a little swollen, nowhere tender, slightly tumid in the epigastric region; the liver was not enlarged, the edge of the spleen only just palpable. She died about seven months from the onset of the fever. It is quite possible that the onset of the attack may have been in February, when she had tonsilitis, in which case the duration was over a year.

Read at the Association of Physicians of Great Britain and Ireland, Edinburgh, June 12, 1908.

Q.J.M., Jan. 1909.

THE RECTAL SHELF: A NEGLECTED RECTAL SIGN OF VALUE IN THE DIAGNOSIS AND PROGNOSIS OF OBSCURE MALIGNANT AND INFLAMMATORY DISEASE WITHIN THE ABDOMEN

George Blumer, M.D.

George Blumer (1872-1962) was an English born American surgeon. He was Dean of the Medical Faculty at Yale. He lived to witness the tragic 1906 San Francisco earthquake and wrote a detailed first hand account. His important finding and defining the rectal shelf as a sign in neoplastic or in inflammatory bowel disease was published in the *Albany Medical Annals*, 30, pp. 361-366, in 1909. (White 2009)

The diagnosis of intraabdominal disease is a subject which exerts a good deal of fascination over the mind of the clinician, partly on account of the many disease possibilities which lie within the abdominal cavity, and partly on account of that obscurity which lends a sense of mystery and stimulates the observer to his greatest effort. Among the more obscure abdominal disorders neoplasms of the various organs and inflammations of a chronic character present great difficulties in diagnosis. Malignant and inflammatory conditions may indeed be confounded with one another, and this is especially the case, as Janeway and others have pointed out, in certain forms of localized peritonitis which stimulate new growth. In the case of malignant disease it is of the greatest import to the patient and the practitioner to recognize the process early, and from the diagnostic and prognostic stand-point the detection of metastases is of paramount importance. For these reasons any new (an epigrammatist has remarked that "the new things in medicine are the things which have been forgotten") or neglected sign which may be of value in intraabdominal diagnosis merits description. The sign which I wish to bring to your attention is one which I have been observing for the past two or three years. It is not, as I shall presently show you, a new sign, but for some reason it seems never to have gotten into the text books, and scarcely at all into the periodical literature. I prefer to call it the rectal shelf, because that best describes its feel.

In 1895, H. Strauss, the German gastrologist, discussing some operative cases of carcinoma of the stomach says, "We found at the operation on this case carcinoma metastases in the liver, in the retroperitoneal tissue, and in Douglas' pouch, a situation which we have found before as a site of metastisis, and which *on accout*

of its explorability merits more frequent examination in these cases." (italics mine) Four years later the same writer discussing the diagnosis of gastric carcinoma says: "I have previously noted that one finds *early and the only metatasis* (italics mine) in some cases in Douglas' pouch. I have since seen two cases, in one of which there was special interest, as this was the point that decided between ulcer and carcinoma." Until an article by Schnitzler, published last year, Strauss seems to have been the only writer, except Kelling, who emphasized the importance of metastases in Douglas' pouch from the clinical side. The rectal tumor which forms in these cases has occasionally been noted, as I shall show, and the pathologists have been impressed by the not infrequent occurrence of metastases in this location. Thus Orth, in the sixth edition of his "Diagnostik" says, in speaking of the pelvis, "A very special interest attached to this region in tuberculosis and carcinoma of the peritoneum, especially the disseminated type. While there may be no tubercle in the neighborhood and no cancer nodules, there occurs, as a rule between the rectum and bladder, a metastasis sufficient to cause pressure, due to implantation of infective material in this, the most dependent portion of the peritoneal cavity. As a result there is often a circumscribed fibrous or productive inflammation. Through coalescence of tumor nodules there can form a board-like inflammation of the serous and subserous tissues which can reach the rectum and even penetrate its wall, and may give rise during life to a diagnosis of rectal cancer." Chiari substantiates this statement, and remarks that such metastases are moderately frequent in gastric carcinoma.

From clinical reports it is evident that the sign has been seen from time to time, and sometimes correctly interpreted, but its general significance has usually been overlooked. Thus Sym, of Edinburgh, describes in 1835, a case of tubercular peritonitis, proved by autopsy, in which he states that the rectum was examined during life by the medical attendant who found a tumor from its anterior wall encroaching upon it so as to prevent injections from passing up. Similar observations in connection with operations for carcinoma of the stomach are recorded by Griffon and Nattan-Larrier, and also by Payr in his interesting article on coincident stenosis of the pylorus and intestine. Toyosumi and Kelling publish similar cases: the latter remarks, "I examine every patient (with suspected carcinoma of the stomach) per rectum for glands in Douglas' pouch and for rectal carcinoma. This is not so infrequent with stomach carcinoma that one can afford not to examine every case rectally."

It is evident from these observations that under certain conditions malignant neoplasms within the abdomen metastasize to Douglas' pouch, and that in certain inflammatory conditions of an infectious nature the infective agent may set up marked localized changes in the same region. I might add that a similar condition may be produced in the female by extension of a uterine tumor to the pelvic cavity, and possibly in the male a bladder neoplasm might lead to the same result. The effect of this malignant or inflammatory infiltration of Douglas' cul de sac is the formation of the palpable rectal tumor which I have described as the rectal shelf. What, then, are the characteristics which distinguish the rectal shelf from other forms of rectal neoplasm, and what is its clinical value?

If one passes the finger into the rectum in these cases the lower portion of the bowel is usually normal, it is not until the prostate gland has been passed that any abnormality is detected. Just above the prostate in some cases, in others at the limit of palpability, two to four centimeters above, if the finger is passed along the anterior rectal wall it impinges upon a shelf of almost cartilaginous feel which projects into the rectal cavity. In some cases further palpation shows that the whole rectum is involved in an annular zone of infiltration more marked anteriorly and tapering off toward the posterior wall, a signet ring stricture, as Schnitzler calls it. In such cases the infiltration is no longer confined to Douglas' pouch but has involved the submucosa of the rectum in which the new formation may spread quite widely. The infiltrated area is more or less fixed, it is shelf-like, or peg-like, at the most prominent portion, and there is no ulceration of the mucous membrane over it. This lack of ulceration of the overlying mucosa, together with the peculiar shape, is what distinguishes the rectal shelf from a primary rectal neoplasm. Furthermore, the rectal shelf is not associated with the passage of blood and pus in the stools as is an ulcerated rectal neoplasm. There is some possibility of mistaking other conditions for the shelf. The lower Houston's fold is at times thickened, but I have not met with a case in which this caused any real confusion, as it has not the board-like, almost cartilaginous feel of the rectal shelf. In one instance I was deceived by a small, subperitoneal myoma which projected into Douglas's pouch and impinged on the rectal wall.

The clinical significance and value of the rectal shelf varies in different cases. At times it is merely useful in confirming a diagnosis, at others of great diagnostic and prognostic value. It must not be forgotten that in patients in whom the primary growth is latent the metastasis may be taken for the primary growth and has indeed in several instances been removed surgically as carcinoma of the rectum. Symptoms of obstruction in the rectum may be marked, as in some of Schnitzler's cases. If the rectal shelf is recognized as such it may therefore be of great value in pointing to a latent neoplasm elsewhere in the abdominal cavity. In the great majority of instances the primary growth will be in the stomach, indeed I have found but two exceptions to the rule, one published by Schnitzler, in which the primary growth was in the pancreas, and one observed by myself in which it was in the gall-bladder. Curiously enough the patients with gastric carcinoma and a rectal shelf are nearly all males; in females cancer cells gaining access to the peritoneum tend to implant in the ovary and cause ovarian metastases. One female patient of Kappeler's had both a rectal shelf and an ovarian metastasis, and I have seen one female patient with a probably gastric carcinoma and a rectal shelf. I have no accurate figures to show how frequent this form of metastasis is in gastric carcinoma. I have records of nine patients with undoubted carcinoma of the stomach in whom a rectal examination was made; in five of these a rectal shelf was present. All of these patients were males. Schnitzler states that he has observed this form of metastasis eleven times, but does not give the number of negative cases. The other published cases are scattered. I should judge that it is not unlikely that one-third of the patients with gastric carcinoma have a rectal shelf. Occasionally the shelf develops late,

and there are one or two cases on record where over a year after an operation for gastric carcinoma a second operation for rectal obstruction from this form of meta-stasis has been needed. In one patient in my series, a woman with the typical signs and symptoms of atrophic cirrhosis of the liver, the presence of the rectal shelf led to the discovery of an entirely latent epithelioma of the cervix uteri.

The rectal shelf is of prognostic value mainly in cases of gastric carcinoma where the ordinary methods of abdominal examination leave doubt as to the extent of the growth and the possibility of its removal. It is obvious that when the rectal shelf is found metastases in the glands in the region of the stomach are almost certainly present, and most likely other distant metastases. Where the shelf is present, therefore, radical operative procedures are contraindicated and the prognosis is definitely bad. Of course, a gastroenterotomy to render the patient more comfortable may be advisable, and when the rectal metastasis is very pronounced colotomy also has to be done at times.

It must be emphasized that a similar shelf may be found in cases of diffuse inflammation of the peritoneum, especially diffuse tuberculosis. In a case seen with Dr. L. C. Sanford, a young woman with multiple nodules in the abdomen and a very marked shelf, operation showed a diffuse tubercular peritonitis with extensive peritoneal infiltration. This sign is not then of value in differentiating new growths from the diffuse forms of tubercular peritonitis, but in cases where the inflammatory lesion is localized and simulates new growth it may be of great value. I have in several patients with chronic appendicitis and pelvic inflammatory disease felt what might be described as partial shelves, but these were not nearly so extensive as the shelf found with tubercular peritonitis and neoplasm, they were definitely one sided, and did not occupy the typical situation of the true rectal shelf on the anterior wall of the rectum.

Summary

In certain forms of carcinoma of the abdominal organs, notably gastric carcinoma, and in some cases of tubercular peritonitis, implantation metastases in Douglas' pouch are common.

These metastases impinge upon the rectum and may infiltrate its submucosa, causing a peculiar shelf-like tumor on the anterior rectal wall, readily felt by the examining finger.

In cases of gastric carcinoma this may be an early metastasis, and occurs especially in males.

In such cases the primary tumor may be latent and the metastasis may be large enough to cause symptoms of obstruction. It has been mistaken at times for rectal carcinoma and has been removed as such.

The not infrequent occurrence of this rectal shelf makes it a diagnostic and prognostic sign of a good deal of importance, and warrants the statement that in no case of obscure abdominal disease should a rectal examination be omitted.

PECULIAR ELONGATED AND SICKLE-SHAPED RED BLOOD CORPUSCLES IN A CASE OF SEVERE ANEMIA

James Bryan Herrick, M. D.

James Bryan Herrick (1861-1954) was an American physician with an acute interest in hematology. He published in 1912 the correct theory that thrombosis of a coronary artery was the mechanism of a heart attack. This following essay was a serious discovery. He found sickle shaped blood cells on a blood film of a medical student from the Carribean. This astute finding led to the understanding of sickle-cell disease and it's West African source. His account was published in the *Archives of Internal Medicine*, 6, pp. 517-521, in 1910. (White 2009)

This case is reported because of the unusual blood findings, no duplicate of which I have ever seen described. Whether the blood picture represents merely a freakish poikilocytosis or is dependent on some peculiar physical or chemical condition of the blood, or is characteristic of some particular disease, I cannot at present answer. I report some details that may seem non-essential, thinking that if a similar blood condition is found in some other case a comparison of clinical conditions may help in solving the problem.

The patient was an intelligent negro of 20, who had been in the United States three months, during which time he was a student in one of the professional schools in Chicago. His former residence had been Grenada, West Indies, where he had been born and brought up, one of a family of four children, all living, and all well with the exception of himself. His mother was living and in good health; his father had died of accident. At the age of 10 the patient had had yaws. This was a common disease in the locality where he lived. The lesions, as he described them, had been pustular, with formation of ulcers and scabs. On healing, scars, many of which he pointed out, were left. Some of the ulcers had been as large as a silver quarter of a dollar. The disease lasted about one year and during this time he had felt somewhat weak and indisposed. Most of the ulcers had been on the legs and the patient himself had thought that this location of the lesions might have been due to the bruises and scratches that were frequently produced as he ran about, a barefoot boy, through the streets and the brush. He was sure he had never had ground-itch, though he said it was not uncommon in Grenada. He had attended school up to the age of 17. Since leaving school, that is, for the past three years, he had felt a disinclination to take exercise. For about a year he had noticed some palpitation

and shortness of breath which he had attributed to excessive smoking. There had been times when he thought he was bilious and when the white of the eyes had been tinged with yellow. At such times he had not had any pain, chill or fever. Three years previously he had had a purulent discharge from the right ear lasting six months. He had had no diarrheas and no hemorrhages at any time. He denied syphilis and gonorrhea. There was never any rheumatism or other joint trouble. On landing in New York in September, 1904, he had a sore on one ankle for which he consulted a physician. Tincture of iodin was applied and in a week the sore had healed, leaving a scar similar to the others on the limbs. For the past five weeks he had been coughing. Two days prior to examination he had "taken cold," his cough had grown worse and he had had a slight chill, followed by fever. It was this cough and fever for which he wished treatment at the hospital, and of which he chiefly complained, though he mentioned also that he felt weak and dizzy, had headache and catarrh of the nose.

Physical Examination

This showed him to be a young man of typical negro facies, with black, curly hair. He was fairly well developed physically and was bright and intelligent. There was a tinge of yellow in the sclerae and the visible mucous membranes were pale. The eyes were normal; the pupils showed prompt reaction to light and in accommodation. The hearing was good; there was no discharge from the ear. The nose showed chronic and acute rhinitis. The tongue was coated, the pharynx slightly reddened; no scars or other lesions were found here. The cervical glands were definitely enlarged, hard and not painful. The axillary, inguinal and epitrochlear glands were also enlarged, some in the axilla being of the size of almonds. Over the chest and abdomen were several good-sized leukodermatous patches, the intervening skin being rather deeply pigmented. The scars to which he had referred were nearly all located on the legs and thighs, some in the former location being as much as 3 cm. in diameter. There were perhaps twenty scars in all. They were rounded or oval, sometimes of irregular contour, the edges clean-cut; some were like tissue paper or thin parchment to the touch and were lighter in color than the surrounding skin. They were strikingly like scars often seen as a result of syphilis. The chest was well formed. There was fair expansion. Numerous rales, mostly of the moist variety, were heard scattered throughout the chest, especially posteriorly. There was a slight relative dulness over the base of either lung behind. The heart was enlarged to the left, the apex impulse being in the sixth interspace one inch to the left of the left mammillary line. There was but a slight increase in the dulness to the right. A soft systolic murmur, not well transmitted in any direction, was heard over the base of the heart. A faint systolic murmur, or perhaps it would be better to call it an impure first tone was heard at the apex. The heart's action reminded one of a heart under strong stimulation, though no history of ingestion of a stimulant of any kind was obtainable. Basedow's findings were not to be made out. The pulse was of good quality and of fair volume. The abdomen was not distended nor was it tender. Neither spleen nor liver

could be palpated. There was no tenderness over the gall-bladder region. The genitalia were normal. The patellar reflexes were sluggish. There was no ataxia and there were no sensory disturbances.

The temperature on admission was 101 F. It varied between 99 and 101 for four days, then gradually subsided, though for the next three weeks it was often found between 99 and 100 F., though with no regularity. The pulse varied from 64 to 104, averaging about 80. There was never any rapid breathing.

Urine and Sputum

The urine was amber in color, specific gravity 1.010 to 1.014, slightly increased in amount 2,000 c.c. acid, contained a distinct trace of serum-albumin, a few granular and hyaline casts. This represents the average of several examinations. The urine on admission had a trace of bile. December 28, urinary examinations for hemoglobin and hematoporphyrin were made and none found. Tests were made for paramidophenol, but none was found.

No tubercle bacilli were discovered in the sputum.

Blood Examination

The blood-count on Dec. 26, 1904, was: Red corpuscles, 2,570,000; white corpuscles, 40,000; hemoglobin (Dare) 40 per cent. color index, 0.78. December 31 the count was as follows:

Erythocytes, 2,880,000.
Leukocytes, 15,250.
Hemoglobin, 50 percent. (Dare).

The red corpuscles varied much in size, many microcytes being seen and some macrocytes. Polychromatophilia was present. Nucleated reds were numerous, 74 being seen in a count of 200 leukocytes, there being about 5,000 to the c.mm. The shape of the reds was very irregular, but what especially attracted attention was the large number of thin, elongated, sickle-shaped and crescent-shaped forms. These were seen in fresh specimens, no matter in what way the blood was spread on the slide and they were seen also in specimens fixed by heat, by alcohol and ether, and stained with the Ehrlich triacid stain as well as with control stains. They were not seen in specimens of blood taken at the same time from other individuals and prepared under exactly similar conditions. They were surely not artefacts, nor were they any form of parasite. In staining reactions they were exactly like their neighbors, the ordinary red corpuscles, though many took the stain heavily. In a few of the elongated forms a nucleus was seen. In the fresh specimen where there was a slight current in the blood before it had become entirely quiet, all of the red corpuscles, the elongated forms as well as those of ordinary form, seemed to be unusually

pliable and flexible, bending and twisting in a remark-able manner as they bumped against each other or crowded through a narrow space and seeming almost rubber-like in their elastic resumption of the former shape. One received the impression that the flattened red discs might by reason of unusual pliability be rolled up as it were into a long narrow bundle. Once or twice I saw a corpuscle of ordinary form turn in such a way as to be seen on edge, when its appearance was suggestive of these peculiar forms.

The white corpuscles were made up of polymorphonuclear neutrophils 72 per cent., small mononuclear lymphocytes 15 per cent., large mononuclear forms 7 per cent., polymorphonuclear eosinophils 5 per cent., myelocytes (?) 1 per cent. Many polymorphonuclear cells and some mononuclear forms contained basophilic granules (Neusser's perinuclear basophils (?)). In overheated specimens especially, a number of cells with shadowy outlines and staining but slightly were seen. These resembled white cells.

Stools

The stools were examined not only as a matter of routine, but because of the possibility of detecting the presence of some parasite that might explain the leosinophilia, leukocytosis and anemia, a possibility not at all unlikely in one coming from the tropics and who had lived where ground-itch was a common occurrence. Many stools were thoroughly studied. Considerable mucus was found in some of the stools passed soon after admission, and some of the mucus was blood-stained. No blood was found in the interior of the fecal masses. On two occasions preceding the giving of the thymold, a body was found resembling almost typically the egg of *Ankylostoma duodenale.* Portions of the stools were incubated, but no embryos were to be made out. Thymol was given, but neither eggs nor embryos could be found in the stools, following its administration.

Treatment and Course of Disease

Under treatment, consisting of rest, nourishing food and syrup of the iodid of iron, the fever and riles disappeared, the glands became smaller, the blood improved in quality and the patient left the hospital after a four-weeks' stay, declaring that he felt well. The possible therapeutic influence of the thymol must also not be overlooked. The blood at this time showed 3,900,000 red corpuscles, 15,000 white, 58 per cent. hemoglobin. There was still to be seen a tendency to the peculiar crescent-shape in the red corpuscles though this was by no means so noticeable as before. Nu-cleated reds were present, though in smaller numbers. Eosinophils were found as before, making up about 5 per cent. of the total number of leukocytes.

We were at a loss to account for this peculiar complexus of symptoms, a condition evidently chronic as revealed by the history of the past three years, with yaws and suppurating otitis as predecessors, yet with acute exacerbations, a condition not clearly explained on the basis of an organic lesion in any one organ, yet showing cardiac enlargement, albuminuria and cylindruria, general adenopathy, icterus, with a secondary

anemia not remark-able for the great reduction in red corpuscles or hemoglobin, but strikingly atypical in the large number of nucleated red corpuscles of the normoblastic type and in the tendency of the erythrocytes to assume a slender sickle-like shape. The leukocytosis with a rather high eosinophil count was also to be noted.

An attempt was made to keep track of the patient, and while he was never afterward under my professional care he was twice seen by myself and several times by Dr. E. E. Irons, whose notes and blood-examinations are here given:

January, 1906: Patient in a hospital for a few days with bronchitis. Rapid recovery.

March 7, 1906: Patient in bed with fever, bronchitis; feels weak. No diarrhea. Red blood corpuscles 2,700,000, white 30,500; hemoglobin 55 per cent. Blood shows many elongated erythrocytes, a few microcytes. The elongated and spindle-forms seemed to stain more darkly than the normal round red corpuscles. No parasites were seen. The differential count of the white cells showed polynuclear neutrophils 58, large mononuclear 12, small mononuclear 22, eosinophils 7, myelocytes 1. There were 2,279 normoblasts to the cubic millimeter.

A count on March 14, 1906, showed an increase in the reds, a lessening of the whites, but was in other respects practically the same. The stool was normal in appearance, formed, yellowish brown, and no blood or eggs were found. The urine was acid, clear, with no blood or abnormal pigment. There was a trace of albumin, and several granular and hyaline casts were found.

In May, 1906, the patient was seen by Dr. Irons, who found him with some fluid in the left knee-joint; the temperature was 100. Gonorrhea was denied. The patient ascribed the joint trouble to a wrench of the knee a few days before. He recovered after ten days of rest in bed.

In April, 1907, the young man reported that he had been laid up in a hospital from Dec. 26, 1906, to Feb. 26, 1907, with what he called muscular rheumatism. His illness had begun with malaise, pain in the back, the muscles of the legs and arms. He had had a slight fever and was pale. A few days before this illness he had suffered from one of his "bilious" attacks, in which he had had quite severe epigastric pain, had vomited and had later noticed that the urine was dark and that the sclerae' were yellowish, though he was inclined to think the icteric hue had been present before the onset of the pain. He was still, he said, somewhat short of breath, but in other respects felt quite well. Since then I have never seen or heard from him.

Comment

No conclusions can be drawn from this case. Not even a definite diagnosis can be made. Syphilis is suggested by many of the facts, such as adenopathy and the condition of the heart and kidneys; it might explain the anemia, the arthritis and perhaps also the temperature, cough and attacks of pain resembling hepatic or gall-bladder disease, for as is well known, visceral syphilis may furnish a most bizarre group of symptoms. The Wassermann test was not in use at this time. The scars said to have been due to yaws were like those left by syphilis.

The patient coming from the tropics, one thought of intestinal parasites such as uncinaria as a possible explanation of the anemia and the eosinophilia. What were thought to be eggs were found on one occasion only, and after thymol there was temporary improvement.

The odd blood picture made one examine for possible toxic effects of the coal-tar preparations, but neither from the history nor from the examination of the urine was there any evidence that such drugs were habitually taken. We were at this time particularly interested in the subject of chronic acetanilid intoxication as well as in uncinariasis, having just had a case of each of these interesting conditions under observation, so that we were on the lookout for such out-of-the-way diseases.

The question of diagnosis must remain an open one unless reports of other similar cases with the same peculiar blood-picture shall clear up this feature.

Schleip, in his "Atlas," pictures fresh unstained preparations of red blood-corpuscles made by his method of diluting the blood 1 to 10 with physiologic salt solution and examining with the aid of the hanging drop chamber Some of the corpuscles remind one a little of these forms I have described. Yet they are not exactly the same.

Professor Hektoen showed me a specimen that he had encountered in the course of some of his hematologic work, which most nearly resembles these forms. This preparation was one in which washed human corpuscles were suspended in a one-eighth-normal solution of cane-sugar. But neither Dr. Hektoen nor I have been able to reproduce the exact picture again, though using cane sugar solution of the same strength. This, while suggesting that the chemical composition of the fluid suspending the corpuscles may have something to do with these peculiar formations, perhaps suggests more strongly that some unrecognized change in the composition of the corpuscle itself may be the determining factor.

103 State Street.

FIVE DIAGNOSTIC METHODS OF JOHN BENJAMIN MURPHY, M.D.

Guy G. Dowdall, M.D.

John Murphy (1857-1916) was an American master surgeon and was known for his pioneering work in surgical anastomosis. Murphy was considered an excellent teacher and diagnostician. What follows here are his primary diagnostic methods as recorded by an associate surgeon Guy Dowdall. These techniques were first published in the *Archives of Diagnosis* in January, 1910 and later in the *Surgical Clinics of John Murphy*, 3, pp. 459-466, in 1912. (White 2009)

In the every-day work of a large surgical clinic, where there is maintained an aggressive spirit of progress, new ideas and new methods are constantly being tried, and deductions made as to their value. Those proving of no merit are soon discarded, but those of worth are adopted, and in time become a part of the regular routine procedure. The longer the accepted methods are used without showing signs of being fallacious, or without being superseded by better ones, the more weight is given them. This is true in the matter of operative technic, but it is still more true of diagnostic methods, and the latter, if possessing real merit, are of value not only to the surgeon, but also to the general practitioner.

In the service of Dr. J. B. Murphy there are in use five diagnostic methods which were original with him, and which have been used by him for a great many years. They have been thoroughly tried out, and have proved their unquestioned value as aids in the differential diagnosis of some of the pathologic conditions within the abdomen. Their reliability and simplicity of execution make them easy of application and increase their usefulness, especially to the physician in general practice.

The first is what has been called by Dr. Murphy the "fist percussion of the kidney," and is used to determine the presence or absence of an acute pathologic condition within that organ. The patient, with clothing removed above the waist, is seated in an upright position on a stool, and is then instructed to bend forward as far as possible. With the patient in this position the examiner, from behind, places his left hand flat upon the back of the patient over the kidney of the one side or the other, care being taken to have the hand pressed firmly upon the back. The clenched right hand of the examiner is then brought down with considerable force upon the dorsum of the fixed hand, and if an acute congestion, infarction, retention in the pelvis of the kidney, or ureteral obstruction

exists in that kidney, the patient will cry out with the pain of the blow. It is analogous to striking a distended urinary bladder, and if the pathologic condition be present, the result will be decidedly apparent. A good sharp blow is used, but it is not necessary to use force enough to aggravate any diseased condition within the kidney. A control test is advised by first using the blow on the sound side and then on the suspected side.

A second method, and one depending upon the same principle as the preceding one, is used by Dr. Murphy in his examination for an acute infection of the gall-bladder, or acute obstruction of the cystic or common duct, with or without infection. The examiner, sitting at the right side of the recumbent patient, presses the tip of the second finger of the left hand, flexed at a right angle, firmly up under the costal arch at the tip of the ninth cartilage. The patient is instructed to take a deep breath, and at the height of the inspiration, when the gall-bladder is forced below the costal guard, the flexed finger is struck forcibly with the ulnar side of the open right hand of the examiner, and if there be an inflammation or a retention in the biliary tract, the patient will announce that the blow causes him severe pain. One is again striking an overdistended or inflamed viscus that contains extremely sensitive nerve-filaments. Dr. Murphy calls this the "hammer-stroke percussion." Sufficient force was used to sink the finger well up under the costal arch.

Another method, designated by him as the "deep-grip palpation," is somewhat similar to the above, and is also used in an examination of a suspected gall-bladder disease. It is based upon another mechanical method of squeezing the gall-bladder, de-pending upon the diaphragm to tell the story. Standing directly behind the patient, provided the patient is well enough to assume an upright position, if not, the examiner reaches over the recumbent patient from the head, the right hand of the examiner curls up under the costal arch at the tip of the ninth cartilage, the patient is requested to take a deep breath, and, at the end of the expiration, the examining fingers seek the gall-bladder area and fix it from beneath. The diaphragm, descending from above with the beginning inspiration, brings down the liver and gall-bladder, and if a cholecystitis or cholelithic obstruction is present, the descent is checked suddenly with an accompanying groan from the patient, for the diaphragm, acting as the great pistol of respiration, forces the distended, inflamed, or congested gall-bladder down upon the firmly fixed hand, and the result is an abrupt cessation of the inspiratory act, plainly shown by the patient, for he feels a severe pain.

Still another method used by Dr. Murphy is called by him the "piano percussion." It is used to demonstrate a small quantity of fluid or exudate in the abdominal cavity, resting on the hollow viscera, the intestine, and is based upon the peculiarly characteristic percussion-note given off when the abdominal wall over the fluid is struck by the four fingers, one after the other, beginning with the fourth and rapidly going to the index-finger. There is a complete absence of the tympanitic note which one gets in this condition when the ordinary percussion methods are used, for with the usual percussion stroke the tympanitic note from the distended bowel so obscures the faint flat note coming from the fluid that the latter is entirely lost. This "piano percussion" is so superficial a stroke, or rather series of strokes, falling almost simultaneously, that only the flat note

from the fluid is brought out. It is a somewhat delicate stroke, and requires practice to make the fingers fall properly and in order, but it is of considerable value, and will help to prevent an error in diagnosis.

And, finally, to one other method attention is called. It is most simple, and should be used by every careful examiner: The simultaneous palpation of both iliac fossae in cases of suspected acute appendiceal involvement. We have all noted in cases where there is considerable trouble in the appendix that the affected side offers greater resistance to the examining hand. We palpate, first, the healthy side, and then the other, and see quite a difference, especially in typical cases; but Dr. Murphy has pointed out, and proved by clinical results during the past twenty years (since 1889), that decidedly more information is gained when both sides are palpated simultaneously. Compare the way in which the examiner's left hand sinks into the patient's iliac fossa to the lessened descent of his right hand on the side of the inflamed appendix. The difference is grossly apparent in the typical cases. So it is with the lightly involved appendices, those cases with slight recurring attacks, the atypical cases, that this test is most service-able. An equal pressure on the two sides at the same time, "comparative bimanual examination," will show a difference which, with practice, is discernible in practically all cases where there exists an acute pathologic condition within or around the appendix.

In reporting these methods it is hoped that a working knowledge and use of these procedures will prove of value in that class of difficult cases to which they are applicable, and that it may stimulate also an interest in that most essential field of work, differential diagnosis.

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THE EVOLUTION OF MODERN MEDICINE

Sir William Osler, 1st Baronet, M.D.

William Osler (1849-1919) was a remarkable physician and historian. He was considered by many to be the Father of Modern Medicine, though he felt that honorary title should belong to Avicenna the 10th century Persian physician. His textbook *The Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine* published in 1892 secured his role as the world's leading authority in the teaching of modern medicine. This is an excerpted version of a series lectures given by Sir William Osler at Yale University during April of 1913. The lectures were originally edited by: Fielding H. Garrison, Harvey Cushing, Edward C. Streeter, Leonard L. Mackall, W. W. Francis, and Charles Singer, for the Yale University Press. (White 2009)

ORIGIN OF MEDICINE

MEDICINE arose out of the primal sympathy of man with man; out of the desire to help those in sorrow, need and sickness.

> In the primal sympathy
> Which having been must ever be;
> In the soothing thoughts that spring
> Out of human suffering.

The instinct of self-preservation, the longing to relieve a loved one, and above all, the maternal passion—for such it is—gradually softened the hard race of man—tum genus humanum primum mollescere coepit. In his marvellous sketch of the evolution of man, nothing illustrates more forcibly the prescience of Lucretius than the picture of the growth of sympathy: "When with cries and gestures they taught with broken words that tis right for all men to have pity on the weak." I heard the well-known medical historian, the late Dr. Payne, remark that "the basis of medicine is sympathy and the desire to help others, and whatever is done with this end must be called medicine."

The first lessons came to primitive man by injuries, accidents, bites of beasts and serpents, perhaps for long ages not appreciated by his childlike mind, but, little by little, such experiences crystallized into useful knowledge. The experiments of nature made

clear to him the relation of cause and effect, but it is not likely, as Pliny suggests, that he picked up his earliest knowledge from the observation of certain practices in animals, as the natural phlebotomy of the plethoric hippopotamus, or the use of emetics from the dog, or the use of enemata from the ibis. On the other hand, Celsus is probably right in his account of the origin of rational medicine. "Some of the sick on account of their eagerness took food on the first day, some on account of loathing abstained; and the disease in those who refrained was more relieved. Some ate during a fever, some a little before it, others after it had subsided, and those who had waited to the end did best. For the same reason some at the beginning of an illness used a full diet, others a spare, and the former were made worse. Occurring daily, such things impressed careful men, who noted what had best helped the sick, then began to prescribe them. In this way medicine had its rise from the experience of the recovery of some, of the death of others, distinguishing the hurtful from the salutary things". The association of ideas was suggestive—the plant eyebright was used for centuries in diseases of the eye because a black speck in the flower suggested the pupil of the eye. The old herbals are full of similar illustrations upon which, indeed, the so-called doctrine of signatures depends. Observation came, and with it an ever widening experience. No society so primitive without some evidence of the existence of a healing art, which grew with its growth, and became part of the fabric of its organization.

With primitive medicine, as such, I cannot deal, but I must refer to the oldest existing evidence of a very extraordinary practice, that of trephining. Neolithic skulls with disks of bone removed have been found in nearly all parts of the world. Many careful studies have been made of this procedure, particularly by the great anatomist and surgeon, Paul Broca, and M. Lucas-Championniere has covered the subject in a monograph. Broca suggests that the trephining was done by scratching or scraping, but, as Lucas-Championniere holds, it was also done by a series of perforations made in a circle with flint instruments, and a round piece of skull in this way removed; traces of these drill-holes have been found. The operation was done for epilepsy, infantile convulsions, headache, and various cerebral diseases believed to be caused by confined demons, to whom the hole gave a ready method of escape.

The practice is still extant. Lucas-Championniere saw a Kabyle thoubib who told him that it was quite common among his tribe; he was the son of a family of trephiners, and had undergone the operation four times, his father twelve times; he had three brothers also experts; he did not consider it a dangerous operation. He did it most frequently for pain in the head, and occasionally for fracture.

The operation was sometimes performed upon animals. Shepherds trephined sheep for the staggers. We may say that the modern decompression operation, so much in vogue, is the oldest known surgical procedure.

EGYPTIAN MEDICINE

OUT of the ocean of oblivion, man emerges in history in a highly civilized state on the banks of the Nile, some sixty centuries ago. After millenniums of a gradual upward

progress, which can be traced in the records of the stone age, civilization springs forth Minerva-like, complete, and highly developed, in the Nile Valley. In this sheltered, fertile spot, neolithic man first raised himself above his kindred races of the Mediterranean basin, and it is suggested that by the accidental discovery of copper Egypt "forged the instruments that raised civilization out of the slough of the Stone Age". Of special interest to us is the fact that one of the best-known names of this earliest period is that of a physician—guide, philosopher and friend of the king—a man in a position of wide trust and importance. On leaving Cairo, to go up the Nile, one sees on the right in the desert behind Memphis a terraced pyramid 190 feet in height, "the first large structure of stone known in history." It is the royal tomb of Zoser, the first of a long series with which the Egyptian monarchy sought "to adorn the coming bulk of death." The design of this is attributed to Imhotep, the first figure of a physician to stand out clearly from the mists of antiquity. "In priestly wisdom, in magic, in the formulation of wise proverbs, in medicine and architecture, this remarkable figure of Zoser's reign left so notable a reputation that his name was never forgotten, and 2500 years after his death he had become a God of Medicine, in whom the Greeks, who called him Imouthes, recognized their own AEsculapius." He became a popular god, not only healing men when alive, but taking good care of them in the journeys after death. The facts about this medicinae primus inventor, as he has been called, may be gathered from Kurt Sethe's study. He seems to have corresponded very much to the Greek Asklepios. As a god he is met with comparatively late, between 700 and 332 B.C. Numerous bronze figures of him remain. The oldest memorial mentioning him is a statue of one of his priests, Amasis (No. 14765 in the British Museum). Ptolemy V dedicated to him a temple on the island of Philae. His cult increased much in later days, and a special temple was dedicated to him near Memphis Sethe suggests that the cult of Imhotep gave the inspiration to the Hermetic literature. The association of Imhotep with the famous temple at Edfu is of special interest.

Egypt became a centre from which civilization spread to the other peoples of the Mediterranean. For long centuries, to be learned in all the wisdom of the Egyptians meant the possession of all knowledge. We must come to the land of the Nile for the origin of many of man's most distinctive and highly cherished beliefs. Not only is there a magnificent material civilization, but in records so marvellously preserved in stone we may see, as in a glass, here clearly, there darkly, the picture of man's search after righteousness, the earliest impressions of his moral awakening, the beginnings of the strife in which he has always been engaged for social justice and for the recognition of the rights of the individual. But above all, earlier and more strongly than in any other people, was developed the faith that looked through death, to which, to this day, the noblest of their monuments bear an enduring testimony. With all this, it is not surprising to find a growth in the knowledge of practical medicine; but Egyptian civilization illustrates how crude and primitive may remain a knowledge of disease when conditioned by erroneous views of its nature. At first, the priest and physician were identified, and medicine never became fully dissociated from religion. Only in the later periods did a special group

of physicians arise who were not members of priestly colleges. Maspero states that the Egyptians believed that disease and death were not natural and inevitable, but caused by some malign influence which could use any agency, natural or invisible, and very often belonged to the invisible world. "Often, though, it belongs to the invisible world, and only reveals itself by the malignity of its attacks: it is a god, a spirit, the soul of a dead man, that has cunningly entered a living person, or that throws itself upon him with irresistible violence. Once in possession of the body, the evil influence breaks the bones, sucks out the marrow, drinks the blood, gnaws the intestines and the heart and devours the flesh. The invalid perishes according to the progress of this destructive work; and death speedily ensues, unless the evil genius can be driven out of it before it has committed irreparable damage. Whoever treats a sick person has therefore two equally important duties to perform. He must first discover the nature of the spirit in possession, and, if necessary, its name, and then attack it, drive it out, or even destroy it. He can only succeed by powerful magic, so he must be an expert in reciting incantations, and skilful in making amulets. He must then use medicine (drugs and diet) to contend with the disorders which the presence of the strange being has produced in the body."

In this way it came about that diseases were believed to be due to hostile spirits, or caused by the anger of a god, so that medicines, no matter how powerful, could only be expected to assuage the pain; but magic alone, incantations, spells and prayers, could remove the disease. Experience brought much of the wisdom we call empirical, and the records, extending for thousands of years, show that the Egyptians employed emetics, purgatives, enemata, diuretics, diaphoretics and even bleeding. They had a rich pharmacopoeia derived from the animal, vegetable and mineral kingdoms. In the later periods, specialism reached a remarkable development, and Herodotus remarks that the country was full of physicians;—"One treats only the diseases of the eye, another those of the head, the teeth, the abdomen, or the internal organs."

Our knowledge of Egyptian medicine is derived largely from the remarkable papyri dealing specially with this subject. Of these, six or seven are of the first importance. The most famous is that discovered by Ebers, dating from about 1500 B.C. A superb document, one of the great treasures of the Leipzig Library, it is 20.23 metres long and 30 centimetres high and in a state of wonderful preservation. Others are the Kahun, Berlin, Hearst and British Museum papyri. All these have now been published—the last three quite recently, edited by Wreszinski. I show here a reproduction from which an idea may be had of these remarkable documents. They are motley collections, filled with incantations, charms, magical formulae, symbols, prayers and prescriptions for all sorts of ailments. One is impressed by the richness of the pharmacopoeia, and the high development which the art of pharmacy must have attained. There were gargles, salves, snuffs, inhalations, suppositories, fumigations, enemata, poultices and plasters; and they knew the use of opium, hemlock, the copper salts, squills and castor oil. Surgery was not very highly developed, but the knife and actual cautery were freely used. Ophthalmic surgery was practiced by specialists, and there are many prescriptions in the papyri for ophthalmia.

One department of Egyptian medicine reached a high stage of development, vis., hygiene. Cleanliness of the dwellings, of the cities and of the person was regulated by law, and the priests set a splendid example in their frequent ablutions, shaving of the entire body, and the spotless cleanliness of their clothing. As Diodorus remarks, so evenly ordered was their whole manner of life that it was as if arranged by a learned physician rather than by a lawgiver.

Two world-wide modes of practice found their earliest illustration in ancient Egypt. Magic, the first of these, represented the attitude of primitive man to nature, and really was his religion. He had no idea of immutable laws, but regarded the world about him as changeable and fickle like himself, and "to make life go as he wished, he must be able to please and propitiate or to coerce these forces outside himself."

The point of interest to us is that in the Pyramid Texts—" the oldest chapter in human thinking preserved to us, the remotest reach in the intellectual history of man which we are now able to discern"—one of their six-fold contents relates to the practice of magic. A deep belief existed as to its efficacy, particularly in guiding the dead, who were said to be glorious by reason of mouths equipped with the charms, prayers and ritual of the Pyramid Texts, armed with which alone could the soul escape the innumerable dangers and ordeals of the passage through another world. Man has never lost his belief in the efficacy of magic, in the widest sense of the term. Only a very few of the most intellectual nations have escaped from its shackles. Nobody else has so clearly expressed the origins and relations of magic as Pliny in his "Natural History." "Now, if a man consider the thing well, no marvaile it is that it hath continued thus in so great request and authoritie; for it is the onely Science which seemeth to comprise in itselfe three possessions besides, which have the command and rule of mans mind above any other whatsoever. For to begin withall, no man doubteth but that Magicke tooke root first, and proceeded from Physicke, under the presence of maintaining health, curing, and preventing diseases: things plausible to the world, crept and insinuated farther into the heart of man, with a deepe conceit of some high and divine matter therein more than ordinarie, and in comparison whereof, all other Physicke was but basely accounted. And having thus made way and entrance, the better to fortifie it selfe, and to give a goodly colour and lustre to those fair and flattering promises of things, which our nature is most given to hearken after, on goeth the habite also and cloake of religion: a point, I may tell you, that even in these daies holdeth captivate the spirit of man, and draweth away with it a greater part of the world, and nothing so much. But not content with this successe and good proceeding, to gather more strength and win a greater name, shee entermingled with medicinable receipts and religious ceremonies, the skill of Astrologie and arts Mathematicall; presuming upon this, That all men by nature are very curious and desirous to know their future fortunes, and what shall betide them hereafter, persuading themselves, that all such foreknowledge dependeth upon the course and influence of the starres, which give the truest and most certain light of things to come. Being thus wholly possessed of men, and having their senses and understanding by this meanes fast ynough bound with three sure chains, no marvell if this art grew in processe of time to

such an head, that it was and is at this day reputed by most nations of the earth for the paragon and cheefe of all sciences: insomuch as the mightie kings and monarchs of the Levant are altogether ruled and governed thereby."

The second world-wide practice which finds its earliest record among the Egyptians is the use secretions and parts of the animal body as medicine. The practice was one of great antiquity with primitive man, but the papyri already mentioned contain the earliest known records. Saliva, urine, bile, faeces, various parts of the body, dried and powdered, worms, insects, snakes were important ingredients in the pharmacopoeia. The practice became very widespread throughout the ancient world. Its extent and importance may be best gathered from chapters VII and VIII in the 28th book of Pliny's "Natural History." Several remedies are mentioned as derived from man; others from the elephant, lion, camel, crocodile, and some seventy-nine are prepared from the hyaena. The practice was widely prevalent throughout the Middle Ages, and the pharmacopoeia of the seventeenth and even of the eighteenth century contains many extraordinary ingredients. "The Royal Pharmacopoeia" of Moses Charras (London ed., 1678), the most scientific work of the day, is full of organotherapy and directions for the preparation of medicines from the most loathsome excretions. A curious thing is that with the discoveries of the mummies a belief arose as to the great efficacy of powdered mummy in various maladies. As Sir Thomas Browne remarks in his "Urn Burial": "Mummy has become merchandize. Mizraim cures wounds, and Pharaoh is sold for balsams."

One formula in everyday use has come to us in a curious way from the Egyptians. In the Osiris myth, the youthful Horus loses an eye in his battle with Set. This eye, the symbol of sacrifice, became, next to the sacred beetle, the most common talisman of the country, and all museums are rich in models of the Horus eye in glass or stone.

"When alchemy or chemistry, which had its cradle in Egypt, and derived its name from Khami, an old title for this country, passed to the hands of the Greeks, and later of the Arabs, this sign passed with it. It was also adopted to some extent by the Gnostics of the early Christian church in Egypt. In a cursive form it is found in mediaeval translations of the works of Ptolemy the astrologer, as the sign of the planet Jupiter. As such it was placed upon horoscopes and upon formula containing drugs made for administration to the body, so that the harmful properties of these drugs might be removed under the influence of the lucky planet. At present, in a slightly modified form, it still figures at the top of prescriptions written daily in Great Britain (Rx)."

For centuries Egyptian physicians had a great reputation, and in the Odyssey (Bk. IV), Polydamna, the wife of Thonis, gives medicinal plants to Helen in Egypt—" a country producing an infinite number of drugs . . . where each physician possesses knowledge above all other men." Jeremiah (xlvi, 11) refers to the virgin daughter of Egypt, who should in vain use many medicines. Herodotus tells that Darius had at his court certain Egyptians, whom he reckoned the best skilled physicians in all the world, and he makes the interesting statement that: "Medicine is practiced among them on a plan of separation; each physician treats a single disorder, and no more: thus the country swarms with medical practitioners, some under taking to cure diseases of the

eye, others of the head, others again of the teeth, others of the intestines, and some those which are not local."

A remarkable statement is made by Pliny, in the discussion upon the use of radishes, which are said to cure a "Phthisicke," or ulcer of the lungs—"proofe whereof was found and seen in AEgypt by occasion that the KK. there, caused dead bodies to be cut up, and anatomies to be made, for to search out the maladies whereof men died."

The study of the anatomy of mummies has thrown a very interesting light upon the diseases of the ancient Egyptians, one of the most prevalent of which appears to have been osteo-arthritis. This has been studied by Elliot Smith, Wood Jones, Ruffer and Rietti. The majority of the lesions appear to have been the common osteo-arthritis, which involved not only the men, but many of the pet animals kept in the temples. In a much higher proportion apparently than in modern days, the spinal column was involved. It is interesting to note that the "determinative" of old age in hieroglyphic writing is the picture of a man afflicted with arthritis deformans. Evidences of tuberculosis, rickets and syphilis, according to these authors, have not been found.

A study of the internal organs has been made by Ruffer, who has shown that arterio-sclerosis with calcification was a common disease 8500 years ago; and he holds that it could not have been associated with hard work or alcohol, for the ancient Egyptians did not drink spirits, and they had practically the same hours of work as modern Egyptians, with every seventh day free.

ASSYRIAN AND BABYLONIAN MEDICINE

OF equally great importance in the evolution of medicine was the practically contemporary civilization in Mesopotamia. Science here reached a much higher stage then in the valley of the Nile. An elaborate scheme of the universe was devised, a system growing out of the Divine Will, and a recognition for the first time of a law guiding and controlling heaven and earth alike. Here, too, we find medicine ancillary to religion. Disease was due to evil spirits or demons. "These demons'—invisible to the naked eye were the precursors of the modern germs' and microbes,' while the incantations recited by the priests are the early equivalents of the physician's prescriptions. There were different incantations for different diseases; and they were as mysterious to the masses as are the mystic formulas of the modern physician to the bewildered, yet trusting, patient. Indeed, their mysterious character added to the power supposed to reside in the incantations for driving the demons away. Medicinal remedies accompanied the recital of the incantations, but despite the considerable progress made by such nations of hoary antiquity as the Egyptians and Babylonians in the diagnosis and treatment of common diseases, leading in time to the development of an extensive pharmacology, so long as the cure of disease rested with the priests, the recital of sacred formulas, together with rites that may be conveniently grouped under the head of sympathetic magic, was regarded as equally essential with the taking of the prescribed remedies."

Three points of interest may be referred to in connection with Babylonian medicine. Our first recorded observations on anatomy are in connection with the art of divination—the study of the future by the interpretation of certain signs. The student recognized two divisions of divination—the involuntary, dealing with the interpretation of signs forced upon our attention, such as the phenomena of the heavens, dreams, etc., and voluntary divination, the seeking of signs, more particularly through the inspection of sacrificial animals. This method reached an extraordinary development among the Babylonians, and the cult spread to the Etruscans, Hebrews, and later to the Greeks and Romans.

Of all the organs inspected in a sacrificial animal the liver, from its size, position and richness in blood, impressed the early observers as the most important of the body. Probably on account of the richness in blood it came to be regarded as the seat of life—indeed, the seat of the soul. From this important position the liver was not dislodged for many centuries, and in the Galenic physiology it shared with the heart and the brain in the triple control of the natural, animal and vital spirits. Many expressions in literature indicate how persistent was this belief. Among the Babylonians, the word "liver" was used in hymns and other compositions precisely as we use the word "heart," and Jastrow gives a number of illustrations from Hebrew, Greek and Latin sources illustrating this usage.

The belief arose that through the inspection of this important organ in the sacrificial animal the course of future events could be predicted. "The life or soul, as the seat of life, in the sacrificial animal is, therefore, the divine element in the animal, and the god in accepting the animal, which is involved in the act of bringing it as an offering to a god, identifies himself with the animal—becomes, as it were, one with it. The life in the animal is a reflection of his own life, and since the fate of men rests with the gods, if one can succeed in entering into the mind of a god, and thus ascertain what he purposes to do, the key for the solution of the problem as to what the future has in store will have been found. The liver being the centre of vitality—the seat of the mind, therefore, as well as of the emotions—it becomes in the case of the sacrificial animal, either directly identical with the mind of the god who accepts the animal, or, at all events, a mirror in which the god's mind is reflected; or, to use another figure, a watch regulated to be in sympathetic and perfect accord with a second watch. If, therefore, one can read the liver of the sacrificial animal, one enters, as it were, into the workshop of the divine will."

Hepatoscopy thus became, among the Babylonians, of extraordinary complexity, and the organ of the sheep was studied and figured as early as 3000 B.C. In the divination rites, the lobes, the gall-bladder, the appendages of the upper lobe and the markings were all inspected with unusual care. The earliest known anatomical model, which is here shown, is the clay model of a sheep's liver with the divination text dating from about 2000 B.C., from which Jastrow has worked out the modern anatomical equivalents of the Babylonian terms. To reach a decision on any point, the phenomena of the inspection of the liver were carefully recorded, and the interpretations rested on a more or less natural and original association of ideas. Thus, if the gall-bladder were swollen on the

right side, it pointed to an increase in the strength of the King's army, and was favorable; if on the left side, it indicated rather success of the enemy, and was unfavorable. If the bile duct was long, it pointed to a long life. Gallstones are not infrequently mentioned in the divination texts and might be favorable, or unfavorable. Various interpretations were gathered by the scribes in the reference note-books which serve as guides for the interpretation of the omens and for text-books of instructions in the temple schools.

The art of divination spread widely among the neighboring nations. There are many references in the Bible to the practice. The elders of Moab and Midian came to Balaam "with the rewards of divination in their hand" (Numbers xxii, 7). Joseph's cup of divination was found in Benjamin's sack (Genesis xliv, 5, 12); and in Ezekiel (xxi, 21) the King of Babylon stood at the parting of the way and looked in the liver. Hepatoscopy was also practiced by the Etruscans, and from them it passed to the Greeks and the Romans, among whom it degenerated into a more or less meaningless form. But Jastrow states that in Babylonia and Assyria, where for several thousand years the liver was consistently employed as the sole organ of divination, there are no traces of the rite having fallen into decay, or having been abused by the priests.

In Roman times, Philostratus gives an account of the trial of Apollonius of Tyana, accused of human hepatoscopy by sacrificing a boy in the practice of magic arts against the Emperor. "The liver, which the experts say is the very tripod of their art, does not consist of pure blood; for the heart retains all the uncontaminated blood, and irrigates the whole body with it by the conduits of the arteries; whereas the gall, which is situated next the liver, is stimulated by anger and depressed by fear into the hollows of the liver."

We have seen how early and how widespread was the belief in amulets and charms against the occult powers of darkness. One that has persisted with extraordinary tenacity is the belief in the Evil Eye the power of certain individuals to injure with a look. Of general belief in the older civilizations, and referred to in several places in the Bible, it passed to Greece and Rome, and today is still held fervently in many parts of Europe. The sign of "le corna,"—the first and fourth fingers extended, the others turned down and the thumb closed over them,—still used against the Evil Eye in Italy, was a mystic sign used by the Romans in the festival of Lemuralia. And we meet with the belief also in this country. A child with hemiplegia, at the Infirmary for Diseases of the Nervous System, Philadelphia, from the central part of Pennsylvania, was believed by its parents to have had the Evil Eye cast upon it.

The second contribution of Babylonia and Assyria to medicine—one that affected mankind profoundly—relates to the supposed influence of the heavenly bodies upon man's welfare. A belief that the stars in their courses fought for or against him arose early in their civilizations, and directly out of their studies on astrology and mathematics. The Macrocosm, the heavens that "declare the glory of God," reflect, as in a mirror, the Microcosm, the daily life of man on earth. The first step was the identification of the sun, moon and stars with the gods of the pantheon. Assyrian astronomical observations show an extraordinary development of practical knowledge. The movements of the sun and moon and of the planets were studied; the Assyrians knew the precession of the equinoxes

and many of the fundamental laws of astronomy, and the modern nomenclature dates from their findings. In their days the signs of the zodiac corresponded practically with the twelve constellations whose names they still bear, each division being represented by the symbol of some god, as the Scorpion, the Ram, the Twins, etc. "Changes in the heavens . . . portended changes on earth. The Biblical expression hosts of heaven' for the starry universe admirably reflects the conception held by the Babylonian astrologers. Moon, planets and stars constituted an army in constant activity, executing military manoeuvres which were the result of deliberation and which had in view a fixed purpose. It was the function of the priest—the barqu, or inspector,' as the astrologer as well as the inspector' of the liver was called—to discover this purpose. In order to do so, a system of interpretation was evolved, less logical and less elaborate than the system of hepatoscopy, which was analyzed in the preceding chapter, but nevertheless meriting attention both as an example of the pathetic yearning of men to peer into the minds of the gods, and of the influence that Babylonian-Assyrian astrology exerted throughout the ancient world"

With the rationalizing influence of the Persians the hold of astrology weakened, and according to Jastrow it was this, in combination with Hebrew and Greek modes of thought, that led the priests in the three centuries following the Persian occupation, to exchange their profession of diviners for that of astronomers; and this, he says, marks the beginning of the conflict between religion and science. At first an expression of primitive "science," astrology became a superstition, from which the human mind has not yet escaped. In contrast to divination, astrology does not seem to have made much impression on the Hebrews and definite references in the Bible are scanty. From Babylonia it passed to Greece (without, however, exerting any particular influence upon Greek medicine). Our own language is rich in words of astral significance derived from the Greek, e.g., disaster.

The introduction of astrology into Europe has a passing interest. Apparently the Greeks had made important advances in astronomy before coming in contact with the Babylonians,—who, in all probability, received from the former a scientific conception of the universe. "In Babylonia and Assyria we have astrology first and astronomy afterwards, in Greece we have the sequence reversed—astronomy first and astrology afterwards"

It is surprising to learn that, previous to their contact with the Greeks, astrology as relating to the individual—that is to say, the reading of the stars to determine the conditions under which the individual was born—had no place in the cult of the Babylonians and Assyrians. The individualistic spirit led the Greek to make his gods take note of every action in his life, and his preordained fate might be read in the stars. "A connecting link between the individual and the movements in the heavens was found in an element which they shared in common. Both man and stars moved in obedience to forces from which there was no escape. An inexorable law controlling the planets corresponded to an equally inexorable fate ordained for every individual from his birth. Man was a part of nature and subject to its laws. The thought could therefore arise that, if the conditions in the heavens were studied under which a man was born, that man's

future could be determined in accord with the beliefs associated with the position of the planets rising or visible at the time of birth or, according to other views, at the time of conception. These views take us back directly to the system of astrology developed by Babylonian baru priests. The basis on which the modified Greek system rests is likewise the same that we have observed in Babylonia—a correspondence between heaven and earth, but with this important difference, that instead of the caprice of the gods we have the unalterable fate controlling the entire universe—the movements of the heavens and the life of the individual alike"

From this time on until the Renaissance, like a shadow, astrology follows astronomy. Regarded as two aspects of the same subject, the one, natural astrology, the equivalent of astronomy, was concerned with the study of the heavens, the other, judicial astrology, was concerned with the casting of horoscopes, and reading in the stars the fate of the individual.

As I mentioned, Greek science in its palmy days seems to have been very free from the bad features of astrology. Gilbert Murray remarks that "astrology fell upon the Hellenistic mind as a new disease falls upon some remote island people." But in the Greek conquest of the Roman mind, astrology took a prominent role. It came to Rome as part of the great Hellenizing movement, and the strength of its growth may be gauged from the edicts issued against astrologers as early as the middle of the second century B.C. In his introduction to his recent edition of Book II of the Astronomicon of Manilius, Garrod traces the growth of the cult, which under the Empire had an extraordinary vogue. "Though these (heavenly) signs be far removed from us, yet does he (the god) so make their influences felt, that they give to nations their life and their fate and to each man his own character." Oracles were sought on all occasions, from the planting of a tree to the mating of a horse, and the doctrine of the stars influenced deeply all phases of popular thought and religion. The professional astrologers, as Pliny says, were Chaldeans, Egyptians and Greeks. The Etruscans, too, the professional diviners of Rome, cultivated the science. Many of these "Isiaci conjectores" and "astrologi de circo" were worthless charlatans, but on the whole the science seems to have attracted the attention of thoughtful men of the period. Garrod quotes the following remarkable passage from Tacitus: "My judgment wavers," he says, "I dare not say whether it be fate and necessity immutable which governs the changing course of human affairs—or just chance. Among the wisest of the ancients, as well as among their apes, you will find a conflict of opinion. Many hold fixedly the idea that our beginning and our end—that man himself—is nothing to the Gods at all. The wicked are in prosperity and the good meet tribulation. Others believe that Fate and the facts of this world work together. But this connection they trace not to planetary influences but to a concatenation of natural causes. We choose our life that is free: but the choice once made, what awaits us is fixed and ordered. Good and evil are different from the vulgar opinion of them. Often those who seem to battle with adversity are to be accounted blessed; but the many, even in their prosperity, are miserable. It needs only to bear misfortune bravely, while the fool perishes in his wealth. Outside these rival schools stands the man in the street. No one

will take from him his conviction that at our birth are fixed for us the things that shall be. If some things fall out differently from what was foretold, that is due to the deceit of men that speak what they know not: calling into contempt a science to which past and present alike bear a glorious testimony"

Cato waged war on the Greek physicians and forbade "his uilicus all resort to haruspicem, augurem, hariolum Chaldaeum," but in vain; so widespread became the belief that the great philosopher, Panaetius (who died about 111 B.C.), and two of his friends alone among the stoics, rejected the claims of astrology as a science. So closely related was the subject of mathematics that it, too, fell into disfavor, and in the Theodosian code sentence of death was passed upon mathematicians. Long into the Middle Ages, the same unholy alliance with astrology and divination caused mathematics to be regarded with suspicion, and even Abelard calls it a nefarious study.

The third important feature in Babylonian medicine is the evidence afforded by the famous Hammurabi Code (circa 2000 B.C.) a body of laws, civil and religious, many of which relate to the medical profession. This extraordinary document is a black diorite block 8 feet high, once containing 21 columns on the obverse, 16 and 28 columns on the reverse, with 2540 lines of writing of which now 1114 remain, and surmounted by the figure of the king receiving the law from the Sun-god. Copies of this were set up in Babylon "that anyone oppressed or injured, who had a tale of woe to tell, might come and stand before his image, that of a king of righteousness, and there read the priceless orders of the King, and from the written monument solve his problem" (Jastrow). From the enactments of the code we gather that the medical profession must have been in a highly organized state, for not only was practice regulated in detail, but a scale of fees was laid down, and penalties exacted for malpraxis. Operations were performed, and the veterinary art was recognized. An interesting feature, from which it is lucky that we have in these days escaped, is the application of the "lex talionis" an eye for an eye, bone for a bone, and tooth for a tooth, which is a striking feature of the code.

Some of the laws of the code may be quoted:

Paragraph 215. If a doctor has treated a gentleman for a severe wound with a bronze lances and has cured the man, or has opened an abscess of the eye for a gentleman with the bronze lances and has cured the eye of the gentleman, he shall take ten shekels of silver.

218. If the doctor has treated a gentleman for a severe wound with a lances of bronze and has caused the gentleman to die, or has opened an abscess of the eye for a gentleman and has caused the loss of the gentleman's eye, one shall cut off his hands.

219. If a doctor has treated the severe wound of a slave of a poor man with a bronze lances and has caused his death, he shall render slave for slave.

220. If he has opened his abscess with a bronze lances and has made him lose his eye, he shall pay money, half his price.

221. If a doctor has cured the shattered limb of a gentleman, or has cured the diseased bowel, the patient shall give five shekels of silver to the doctor.

224. If a cow doctor or a sheep doctor has treated a cow or a sheep for a severe wound and cured it, the owner of the cow or sheep shall give one-sixth of a shekel of silver to the doctor as his fee.

HEBREW MEDICINE

THE medicine of the Old Testament betrays both Egyptian and Babylonian influences; the social hygiene is a reflex of regulations the origin of which may be traced in the Pyramid Texts and in the papyri. The regulations in the Pentateuch codes revert in part to primitive times, in part represent advanced views of hygiene. There are doubts if the Pentateuch code really goes back to the days of Moses, but certainly someone "learned in the wisdom of the Egyptians" drew it up. As Neuburger briefly summarizes:

> "The commands concern prophylaxis and suppression of epidemics, suppression of venereal disease and prostitution, care of the skin, baths, food, housing and clothing, regulation of labour, sexual life, discipline of the people, etc. Many of these commands, such as Sabbath rest, circumcision, laws concerning food (interdiction of blood and pork), measures concerning menstruating and lying-in women and those suffering from gonorrhoea, isolation of lepers, and hygiene of the camp, are, in view of the conditions of the climate, surprisingly rational."

Divination, not very widely practiced, was borrowed, no doubt, from Babylonia. Joseph's cup was used for the purpose, and in Numbers, the elders of Balak went to Balaam with the rewards of divination in their hands. The belief in enchantments and witchcraft was universal, and the strong enactments against witches in the Old Testament made a belief in them almost imperative until more rational beliefs came into vogue in the eighteenth and nineteenth centuries.

Whatever view we may take of it, the medicine of the New Testament is full of interest. Divination is only referred to once in the Acts (xvi, 16), where a damsel is said to be possessed of a spirit of divination "which brought her masters much gain by soothsaying." There is only one mention of astrology (Acts vii, 43); there are no witches, neither are there charms or incantations. The diseases mentioned are numerous: demoniac possession, convulsions, paralysis, skin diseases, as leprosy,— dropsy, haemorrhages, fever, fluxes, blindness and deafness. And the cure is simple usually a fiat of the Lord, rarely with a prayer, or with the use of means such as spittle. They are all miraculous, and the same power was granted to the apostles— "power against unclean spirits, to cast them out, to heal all manner of sickness and all manner of disease." And more than

this, not only the blind received their sight, the lame walked, the lepers were cleansed, the deaf heard, but even the dead were raised up. No question of the mandate. He who went about doing good was a physician of the body as well as of the soul, and could the rich promises of the Gospel have been fulfilled, there would have been no need of a new dispensation of science. It may be because the children of this world have never been able to accept its hard sayings—the insistence upon poverty, upon humility, upon peace that Christianity has lost touch no less with the practice than with the principles of its Founder. Yet, all through the centuries, the Church has never wholly abandoned the claim to apostolic healing; nor is there any reason why she should. To the miraculous there should be no time limit—only conditions have changed and nowadays to have a mountain-moving faith is not easy. Still, the possession is cherished, and it adds enormously to the spice and variety of life to know that men of great intelligence, for example, my good friend, Dr. James J. Walsh of New York, believe in the miracles of Lourdes. Only a few weeks ago, the Bishop of London followed with great success, it is said, the practice of St. James. It does not really concern us much—as Oriental views of disease and its cure have had very little influence on the evolution of scientific medicine—except in illustration of the persistence of an attitude towards disease always widely prevalent, and, indeed, increasing. Nor can we say that the medicine of our great colleague, St. Luke, the Beloved Physician, whose praise is in the Gospels, differs so fundamentally from that of the other writings of the New Testament that we can claim for it a scientific quality. The stories of the miracles have technical terms and are in a language adorned by medical phraseology, but the mental attitude towards disease is certainly not that of a follower of Hippocrates, nor even of a scientifically trained contemporary of Dioscorides.

CHINESE AND JAPANESE MEDICINE

CHINESE medicine illustrates the condition at which a highly intellectual people may arrive, among whom thought and speculation were restricted by religious prohibitions. Perhaps the chief interest in its study lies in the fact that we may see today the persistence of views about disease similar to those which prevailed in ancient Egypt and Babylonia. The Chinese believe in a universal animism, all parts being animated by gods and spectres, and devils swarm everywhere in numbers incalculable. The universe was spontaneously created by the operation of its Tao, "composed of two souls, the Yang and the Yin; the Yang represents light, warmth, production, and life, as also the celestial sphere from which all those blessings emanate; the Yin is darkness, cold, death, and the earth, which, unless animated by the Yang or heaven, is dark, cold, dead. The Yang and the Yin are divided into an infinite number of spirits respectively good and bad, called shen and kwei; every man and every living being contains a shen and a kwei, infused at birth, and departing at death, to return to the Yang and the Yin. Thus man with his dualistic soul is a microcosmos, born from the Macrocosmos spontaneously. Even every object is animated, as well as the Universe of which it is a part."

In the animistic religion of China, the Wu represented a group of persons of both sexes, who wielded, with respect to the world of spirits, capacities and powers not possessed by the rest of men. Many practitioners of Wu were physicians who, in addition to charms and enchantments, used death-banishing medicinal herbs. Of great antiquity, Wu-ism has changed in some ways its outward aspect, but has not altered its fundamental characters. The Wu, as exorcising physicians and practitioners of the medical art, may be traced in classical literature to the time of Confucius. In addition to charms and spells, there were certain famous poems which were repeated, one of which, by Han Yu, of the T'ang epoch, had an extraordinary vogue. De Groot says that the "Ling," or magical power of this poem must have been enormous, seeing that its author was a powerful mandarin, and also one of the loftiest intellects China has produced. This poetic febrifuge is translated in full by de Groot (VI, 1054-1055), and the demon of fever, potent chiefly in the autumn, is admonished to begone to the clear and limpid waters of the deep river.

In the High Medical College at Court, in the T'ang Dynasty, there were four classes of Masters, attached to its two High Medical Chiefs: Masters of Medicine, of Acupuncture, of Manipulation, and two Masters for Frustration by means of Spells.

Soothsaying and exorcism may be traced far back to the fifth and sixth centuries B.C.

In times of epidemic the specialists of Wu-ism, who act as seers, soothsayers and exorcists, engage in processions, stripped to the waist, dancing in a frantic, delirious state, covering themselves with blood by means of prick-balls, or with needles thrust through their tongues, or sitting or stretching themselves on nail points or rows of sword edges. In this way they frighten the spectres of disease. They are nearly all young, and are spoken of as "divining youths," and they use an exorcising magic based on the principle that legions of spectres prone to evil live in the machine of the world. (De Groot, VI, 983-985.)

The Chinese believe that it is the Tao, or "Order of the Universe," which affords immunity from evil, and according to whether or no the birth occurred in a beneficent year, dominated by four double cyclical characters, the horoscope is "heavy" or "light." Those with light horoscopes are specially prone to incurable complaints, but much harm can be averted if such an individual be surrounded with exorcising objects, if he be given proper amulets to wear and proper medicines to swallow, and by selecting for him auspicious days and hours.

Two or three special points may be referred to. The doctrine of the pulse reached such extraordinary development that the whole practice of the art centred round its different characters. There were scores of varieties, which in complication and detail put to confusion the complicated system of some of the old Graeco-Roman writers. The basic idea seems to have been that each part and organ had its own proper pulse, and just as in a stringed instrument each chord has its own tone, so in the human body, if the pulses were in harmony, it meant health; if there was discord, it meant disease. These Chinese views reached Europe in the seventeenth and eighteenth centuries, and there is a very elaborate description of them in Floyer's well-known book. And the idea of harmony in the pulse is met with into the eighteenth century.

Organotherapy was as extensively practiced in China as in Egypt. Parts of organs, various secretions and excretions are very commonly used. One useful method of practice reached a remarkable development, viz., the art of acupuncture— the thrusting of fine needles more or less deeply into the affected part. There are some 388 spots on the body in which acupuncture could be performed, and so well had long experience taught them as to the points of danger, that the course of the arteries may be traced by the tracts that are avoided. The Chinese practiced inoculation for smallpox as early as the eleventh century.

Even the briefest sketch of the condition of Chinese medicine leaves the impression of the appalling stagnation and sterility that may afflict a really intelligent people for thousands of years. It is doubtful if they are today in a very much more advanced condition than were the Egyptians at the time when the Ebers Papyrus was written. From one point of view it is an interesting experiment, as illustrating the state in which a people may remain who have no knowledge of anatomy, physiology or pathology.

Early Japanese medicine has not much to distinguish it from the Chinese. At first purely theurgic, the practice was later characterized by acupuncture and a refined study of the pulse. It has an extensive literature, largely based upon the Chinese, and extending as far back as the beginning of the Christian era. European medicine was introduced by the Portuguese and the Dutch, whose "factory" or "company" physicians were not without influence upon practice. An extraordinary stimulus was given to the belief in European medicine by a dissection made by Mayeno in 1771 demonstrating the position of the organs as shown in the European anatomical tables, and proving the Chinese figures to be incorrect. The next day a translation into Japanese of the anatomical work of Kulmus was begun, and from its appearance in 1773 may be dated the commencement of reforms in medicine. In 1793, the work of de Gorter on internal medicine was translated, and it is interesting to know that before the so-called "opening of Japan" many European works on medicine had been published. In 1857, a Dutch medical school was started in Yedo. Since the political upheaval in 1868, Japan has made rapid progress in scientific medicine, and its institutions and teachers are now among the best known in the world.

CHAPTER II GREEK MEDICINE

OGRAIAE gentis decus! let us sing with Lucretius, one of the great interpreters of Greek thought. How grand and how true is his paean!

> Out of the night, out of the blinding night
> Thy beacon flashes;—hail, beloved light
> Of Greece and Grecian; hail, for in the mirk
> Thou cost reveal each valley and each height.

> Thou art my leader, and the footprints shine,
> Wherein I plant my own . . . .
> The world was shine to read, and having read,
> Before thy children's eyes thou didst outspread
> The fruitful page of knowledge, all the wealth
> Of wisdom, all her plenty for their bread.
> Let us come out of the murky night of the East, heavy with phantoms, into the bright daylight of the West, into the company of men whose thoughts made our thoughts, and whose ways made our ways the men who first dared to look on nature with the clear eyes of the mind.

Browning's famous poem, "Childe Roland to the Dark Tower Came," is an allegory of the pilgrimage of man through the dark places of the earth, on a dismal path beset with demons, and strewn with the wreckage of generations of failures. In his ear tolled the knell of all the lost adventurers, his peers, all lost, lost within sight of the dark Tower itself

> The round squat turret, blind as the fool's heart,
> Built of brown stone, without a counterpart
> In the whole world.

lost in despair at an all-encircling mystery. Not so the Greek Childe Roland who set the slug-horn to his lips and blew a challenge. Neither Shakespeare nor Browning tells us what happened, and the old legend, Childe Roland, is the incarnation of the Greek spirit, the young, light-hearted master of the modern world, at whose trumpet blast the dark towers of ignorance, superstition and deceit have vanished into thin air, as the baseless fabric of a dream. Not that the jeering phantoms have flown! They still beset, in varied form, the path of each generation; but the Achaian Childe Roland gave to man self-confidence, and taught him the lesson that nature's mysteries, to be solved, must be challenged. On a portal of one of the temples of Isis in Egypt was carved: "I am whatever hath been, is, or ever will be, and my veil no man has yet lifted."

The veil of nature the Greek lifted and herein lies his value to us. What of this Genius? How did it arise among the peoples of the AEgean Sea? Those who wish to know the rock whence science was hewn may read the story told in vivid language by Professor Gomperz in his "Greek Thinkers," the fourth volume of which has recently been published (Murray, 1912; Scribner, 1912). In 1912, there was published a book by one of the younger Oxford teachers, "The Greek Genius and Its Meaning to Us," from which those who shrink from the serious study of Gomperz' four volumes may learn something of the spirit of Greece. Let me quote a few lines from his introduction:

> "Europe has nearly four million square miles; Lancashire has 1,700; Attica has 700. Yet this tiny country has given us an art which we, with it and all that the world has done since it for our models, have equalled perhaps, but not surpassed. It has given us the staple of our vocabulary in every domain of thought and knowledge. Politics, tyranny, democracy, anarchism, philosophy, physiology, geology, history these are all Greek words. It has seized and up to the present day kept hold of our higher education. It has exercised an unfailing fascination, even on minds alien or hostile. Rome took her culture thence. Young Romans completed their education in the Greek schools . . . . And so it was with natures less akin to Greece than the Roman. St. Paul, a Hebrew of the Hebrews, who called the wisdom of the Greeks foolishness, was drawn to their Areopagus, and found himself accommodating his gospel to the style, and quoting verses from the poets of this alien race. After him, the Church, which was born to protest against Hellenism, translated its dogmas into the language of Greek thought and finally crystallized them in the philosophy of Aristotle."

Whether a plaything of the gods or a cog in the wheels of the universe this was the problem which life offered to the thinking Greek; and in undertaking its solution, he set in motion the forces that have made our modern civilization. That the problem remains unsolved is nothing in comparison with the supreme fact that in wrestling with it, and in studying the laws of the machine, man is learning to control the small section of it with which he is specially concerned. The veil of thaumaturgy which shrouded the Orient, while not removed, was rent in twain, and for the first time in history, man had a clear vision of the world about him—" had gazed on Nature's naked loveliness" ("Adonais") unabashed and unaffrighted by the supernatural powers about him. Not that the Greek got rid of his gods—far from it!—but he made them so like himself, and lived on terms of such familiarity with them that they inspired no terror.

Livingstone discusses the Greek Genius as displayed to us in certain "notes" the Note of Beauty— the Desire for Freedom the Note of Directness the Note of Humanism the Note of Sanity and of Many-sidedness. Upon some of these characteristics we shall have occasion to dwell in the brief sketch of the rise of scientific medicine among this wonderful people.

We have seen that the primitive man and in the great civilizations of Egypt and Babylonia, the physician evolved from the priest—in Greece he had a dual origin, philosophy and religion. Let us first trace the origins in the philosophers, particularly in the group known as the Ionian Physiologists, whether at home or as colonists in the south of Italy, in whose work the beginnings of scientific medicine may be found. Let me quote a statement from Gomperz:

> "We can trace the springs of Greek success achieved and maintained by the great men of Hellas on the field of scientific inquiry to a remarkable

> conjunction of natural gifts and conditions. There was the teeming wealth of constructive imagination united with the sleepless critical spirit which shrank from no test of audacity; there was the most powerful impulse to generalization coupled with the sharpest faculty for descrying and distinguishing the finest shades of phenomenal peculiarity; there was the religion of Hellas, which afforded complete satisfaction to the requirements of sentiment, and yet left the intelligence free to perform its destructive work; there were the political conditions of a number of rival centres of intellect, of a friction of forces, excluding the possibility of stagnation, and, finally, of an order of state and society strict enough to curb the excesses of children crying for the moon,' and elastic enough not to hamper the soaring flight of superior minds . . . . We have already made acquaintance with two of the sources from which the spirit of criticism derived its nourishment—the metaphysical and dialectical discussions practiced by the Eleatic philosophers, and the semi-historical method which was applied to the myths by Hecataeus and Herodotus. A third source is to be traced to the schools of the physicians. These aimed at eliminating the arbitrary element from the view and knowledge of nature, the beginnings of which were bound up with it in a greater or less degree, though practically without exception and by the force of an inner necessity. A knowledge of medicine was destined to correct that defect, and we shall mark the growth of its most precious fruits in the increased power of observation and the counterpoise it offered to hasty generalizations, as well as in the confidence which learnt to reject untenable fictions, whether produced by luxuriant imagination or by a priori speculations, on the similar ground of self-reliant sense-perception."

The nature philosophers of the Ionian days did not contribute much to medicine proper, but their spirit and their outlook upon nature influenced its students profoundly. Their bold generalizations on the nature of matter and of the elements are still the wonder of chemists. We may trace to one of them, Anaximenes, who regarded air as the primary principle, the doctrine of the "pneuma," or the breath of life—the psychic force which animates the body and leaves it at death "Our soul being air, holds us together." Of another, the famous Heraclitus, possibly a physician, the existing fragments do not relate specially to medicine; but to the philosopher of fire may be traced the doctrine of heat and moisture, and their antitheses, which influenced practice for many centuries. There is evidence in the Hippocratic treatise peri sarkwn of an attempt to apply this doctrine to the human body. The famous expression, panta rhei,—"all things are flowing,"—expresses the incessant flux in which he believed and in which we know all matter exists. No one has said a ruder thing of the profession, for an extant fragment reads: ". . . physicians, who cut, burn, stab, and rack the sick, then complain that they do not get any adequate recompense for it."

The South Italian nature philosophers contributed much more to the science of medicine, and in certain of the colonial towns there were medical schools as early as the

fifth century B.C. The most famous of these physician philosophers was Pythagoras, whose life and work had an extraordinary influence upon medicine, particularly in connection with his theory of numbers, and the importance of critical days. His discovery of the dependence of the pitch of sound on the length of the vibrating chord is one of the most fundamental in acoustics. Among the members of the school which he founded at Crotona were many physicians. who carried his views far and wide throughout Magna Graecia. Nothing in his teaching dominated medicine so much as the doctrine of numbers, the sacredness of which seems to have had an enduring fascination for the medical mind. Many of the common diseases, such as malaria, or typhus, terminating abruptly on special days, favored this belief. How dominant it became and how persistent you may judge from the literature upon critical days, which is rich to the middle of the eighteenth century.

One member of the Crotonian school, Alcmaeon, achieved great distinction in both anatomy and physiology. He first recognized the brain as the organ of the mind, and made careful dissections of the nerves, which he traced to the brain. He described the optic nerves and the Eustachian tubes, made correct observations upon vision, and refuted the common view that the sperma came from the spinal cord. He suggested the definition of health as the maintenance of equilibrium, or an "isonomy" in the material qualities of the body. Of all the South Italian physicians of this period, the personality of none stands out in stronger outlines than that of Empedocles of Agrigentum—physician, physiologist, religious teacher, politician and poet. A wonder-worker, also, and magician, he was acclaimed in the cities as an immortal god by countless thousands desiring oracles or begging the word of healing. That he was a keen student of nature is witnessed by many recorded observations in anatomy and physiology; he reasoned that sensations travel by definite paths to the brain. But our attention must be confined to his introduction of the theory of the four elements—fire, air, earth and water—of which, in varying quantities, all bodies were made up. Health depended upon the due equilibrium of these primitive substances; disease was their disturbance. Corresponding to those were the four essential qualities of heat and cold, moisture and dryness, and upon this four-fold division was engrafted by the later physicians the doctrine of the humors which, from the days of Hippocrates almost to our own, dominated medicine. All sorts of magical powers were attributed to Empedocles. The story of Pantheia whom he called back to life after a thirty days' trance has long clung in the imagination. You remember how Matthew Arnold describes him in the well-known poem, "Empedocles on Etna"—

> But his power
> Swells with the swelling evil of this time,
> And holds men mute to see where it will rise.
> He could stay swift diseases in old days,
> Chain madmen by the music of his lyre,
> Cleanse to sweet airs the breath of poisonous streams,
> And in the mountain-chinks inter the winds.
> This he could do of old

a quotation which will give you an idea of some of the powers attributed to this wonder-working physician.

But of no one of the men of this remarkable circle have we such definite information as of the Crotonian physician Democedes, whose story is given at length by Herodotus; and his story has also the great importance of showing that, even at this early period, a well-devised scheme of public medical service existed in the Greek cities. It dates from the second half of the sixth century B.C.—fully two generations before Hippocrates. A Crotonian, Democedes by name, was found among the slaves of Oroetes. Of his fame as a physician someone had heard and he was called in to treat the dislocated ankle of King Darius. The wily Greek, longing for his home, feared that if he confessed to a knowledge of medicine there would be no chance of escape, but under threat of torture he undertook a treatment which proved successful. Then Herodotus tells his story—how, ill treated at home in Crotona, Democedes went to AEgina, where he set up as a physician and in the second year the State of AEgina hired his services at the price of a talent. In the third year, the Athenians engaged him at 100 minae; and in the fourth, Polycrates of Samos at two talents. Democedes shared the misfortunes of Polycrates and was taken prisoner by Oroetes. Then Herodotus tells how he cured Atossa, the daughter of Cyrus and wife of Darius, of a severe abscess of the breast, but on condition that she help him to escape, and she induced her husband to send an expedition of exploration to Greece under the guidance of Democedes, but with the instructions at all costs to bring back the much prized physician. From Tarentum, Democedes escaped to his native city, but the Persians followed him, and it was with the greatest difficulty that he escaped from their hands. Deprived of their guide, the Persians gave up the expedition and sailed for Asia. In palliation of his flight, Democedes sent a message to Darius that he was engaged to the daughter of Milo, the wrestler, who was in high repute with the King.

Plato has several references to these state physicians, who were evidently elected by a public assembly: "When the assembly meets to elect a physician," and the office was yearly, for in "The Statesman" we find the following: "When the year of office has expired, the pilot, or physician has to come before a court of review" to answer any charges. The physician must have been in practice for some time and attained eminence, before he was deemed worthy of the post of state physician.

"If you and I were physicians, and were advising one another that we were competent to practice as state-physicians, should I not ask about you, and would you not ask about me, Well, but how about Socrates himself, has he good health? and was anyone else ever known to be cured by him whether slave or freeman?"

All that is known of these state physicians has been collected by Pohl, who has traced their evolution into Roman times. That they were secular, independent of the AEsculapian temples, that they were well paid, that there was keen competition to get the most distinguished men, that they were paid by a special tax and that they were much esteemed—are facts to be gleaned from Herodotus and from the inscriptions. The lapidary records, extending over 1000 years, collected by Professor Oehler(8a) of Reina, throw an important light on the state of medicine in Greece and Rome. Greek

vases give representations of these state doctors at work. Dr. E. Pottier has published one showing the treatment of a patient in the clinic.That dissections were practiced by this group of nature philosophers is shown not only by the studies of Alcmaeon, but we have evidence that one of the latest of them, Diogenes of Apollonia, must have made elaborate dissections. In the "Historia Animalium" of Aristotle occurs his account of the blood vessels, which is by far the most elaborate met with in the literature until the writings of Galen. It has, too, the great merit of accuracy (if we bear in mind the fact that it was not until after Aristotle that arteries and veins were differentiated), and indications are given as to the vessels from which blood may be drawn.

ASKLEPIOS

No god made with hands, to use the scriptural phrase, had a more successful "run" than Asklepios for more than a thousand years the consoler and healer of the sons of men. Shorn of his divine attributes he remains our patron saint, our emblematic God of Healing, whose figure with the serpents appears in our seals and charters. He was originally a Thessalian chieftain, whose sons, Machaon and Podalirius, became famous physicians and fought in the Trojan War. Nestor, you may remember, carried off the former, declaring, in the oft-quoted phrase, that a doctor was better worth saving than many warriors unskilled in the treatment of wounds. Later genealogies trace his origin to Apollo, as whose son he is usually regarded. "In the wake of northern tribes this god Aesculapius a more majestic figure than the blameless leech of Homer's song came by land to Epidaurus and was carried by sea to the east-ward island of Cos . . . . Aesculapius grew in importance with the growth of Greece, but may not have attained his greatest power until Greece and Rome were one."(11)

A word on the idea of the serpent as an emblem of the healing art which goes far back into antiquity. The mystical character of the snake, and the natural dread and awe inspired by it, early made it a symbol of supernatural power. There is a libation vase of Gudea, c. 2350 B.C., found at Telloh, now in the Louvre (probably the earliest representation of the symbol), with two serpents entwined round a staff. From the earliest times the snake has been associated with mystic and magic power, and even today, among native races, it plays a part in the initiation of medicine men.

In Greece, the serpent became a symbol of Apollo, and prophetic serpents were kept and fed at his shrine, as well as at that of his son, Asklepios. There was an idea, too, that snakes had a knowledge of herbs, which is referred to in the famous poem of Nikander on Theriaka. You may remember that when Alexander, the famous quack and oracle monger, depicted by Lucian, started out "for revenue," the first thing he did was to provide himself with two of the large, harmless, yellow snakes of Asia Minor.

The exact date of the introduction of the cult into Greece is not known, but its great centres were at Epidaurus, Cos, Pergamos and Tricca. It throve with wonderful rapidity. Asklepios became one of the most popular of the gods. By the time of Alexander it is estimated that there were between three and four hundred temples dedicated to him.

His worship was introduced into Rome at the time of the Great Plague at the beginning of the third century B.C. (as told by Livy in Book XI), and the temple on the island of Tiber became a famous resort. If you can transfer in imagination the Hot Springs of Virginia to the neighborhood of Washington, and put there a group of buildings such as are represented in these outlines of Caton's, add a sumptuous theatre with seating capacity for 20,000, a stadium 600 feet long with a seating capacity of 12,000, and all possible accessories of art and science, you will have an idea of what the temple at Epidaurus, a few miles from Athens, was. "The cult flourished mostly in places which, through climatic or hygienic advantages, were natural health resorts. Those favoured spots on hill or mountain, in the shelter of forests, by rivers or springs of pure flowing water, were conducive to health. The vivifying air, the well cultivated gardens surrounding the shrine, the magnificent view, all tended to cheer the heart with new hope of cure. Many of these temples owed their fame to mineral or merely hot springs. To the homely altars, erected originally by sacred fountains in the neighbourhood of health-giving mineral springs, were later added magnificent temples, pleasure-grounds for festivals, gymnasia in which bodily ailments were treated by physical exercises, baths and inunctions, also, as is proved by excavations, living rooms for the patients. Access to the shrine was forbidden to the unclean and the impure, pregnant women and the mortally afflicted were kept away; no dead body could find a resting-place within the holy precincts, the shelter and the cure of the sick being undertaken by the keepers of inns and boarding-houses in the neighbourhood. The suppliants for aid had to submit to careful purification, to bathe in sea, river or spring, to fast for a prescribed time, to abjure wine and certain articles of diet, and they were only permitted to enter the temple when they were adequately prepared by cleansing, inunction and fumigation. This lengthy and exhausting preparation, partly dietetic, partly suggestive, was accompanied by a solemn service of prayer and sacrifice, whose symbolism tended highly to excite the imagination."

The temples were in charge of members of the guild or fraternity, the head of which was often, though not necessarily, a physician. The Chief was appointed annually. From Caton's excellent sketch you can get a good idea of the ritual, but still better is the delightful description given in the "Plutus" of Aristophanes. After offering honey-cakes and baked meats on the altar, the suppliants arranged themselves on the pallets.

> Soon the Temple servitor
> Put out the lights and bade us fall asleep,
> Nor stir, nor speak, whatever noise we heard.
> So down we lay in orderly repose.
> And I could catch no slumber, not one wink,
> Struck by a nice tureen of broth which stood
> A little distance from an old wife's head,
> Whereto I marvellously longed to creep.
> Then, glancing upwards, I beheld the priest

Whipping the cheese-cakes and figs from off
The holy table; thence he coasted round
To every altar spying what was left.
And everything he found he consecrated
Into a sort of sack—

a procedure which reminds one of the story of "Bel and the Dragon." Then the god came, in the person of the priest, and scanned each patient. He did not neglect physical measures, as he brayed in a mortar cloves, Tenian garlic, verjuice, squills and Sphettian vinegar, with which he made application to the eyes of the patient.

Then the God clucked,
And out there issued from the holy shrine
Two great, enormous serpents . . . .
And underneath the scarlet cloth they crept,
And licked his eyelids, as it seemed to me;
And, mistress dear, before you could have drunk
Of wine ten goblets, Wealth arose and saw.

The incubation sleep, in which indications of cure were divinely sent, formed an important part of the ritual.

The Asklepieion, or Health Temple of Cos, recently excavated, is of special interest, as being at the birthplace of Hippocrates, who was himself an Asklepiad. It is known that Cos was a great medical school. The investigations of Professor Rudolf Hertzog have shown that this temple was very nearly the counterpart of the temple at Epidaurus.

The AEsculapian temples may have furnished a rare field for empirical enquiry. As with our modern hospitals, the larger temple had rich libraries, full of valuable manuscripts and records of cases. That there may have been secular Asklepiads connected with the temple, who were freed entirely from its superstitious practices and theurgic rites, is regarded as doubtful; yet is perhaps not so doubtful as one might think. How often have we physicians to bow ourselves in the house of Rimmon! It is very much the same today at Lourdes, where lay physicians have to look after scores of patients whose faith is too weak or whose maladies are too strong to be relieved by Our Lady of this famous shrine. Even in the Christian era, there is evidence of the association of distinguished physicians with AEsculapian temples. I notice that in one of his anatomical treatises, Galen speaks with affection of a citizen of Pergamos who has been a great benefactor of the AEsculapian temple of that city. In "Marius, the Epicurean," Pater gives a delightful sketch of one of those temple health resorts, and brings in Galen, stating that he had himself undergone the temple sleep; but to this I can find no reference in the general index of Galen's works.

From the votive tablets found at Epidaurus, we get a very good idea of the nature of the cases and of the cures. A large number of them have now been deciphered. There are evidences of various forms of diseases of the joints, affections of women, wounds,

baldness, gout; but we are again in the world of miracles, as you may judge from the following: "Heraicus of Mytilene is bald and entreats the God to make his hair grow. An ointment is applied over night and the next morning he has a thick crop of hair."

There are indications that operations were performed and abscesses opened. From one we gather that dropsy was treated in a novel way: Asklepios cuts off the patient's head, holds him up by the heels, lets the water run out, claps on the patient's head again. Here is one of the invocations: "Oh, blessed Asklepios, God of Healing, it is thanks to thy skill that Diophantes hopes to be relieved from his incurable and horrible gout, no longer to move like a crab, no longer to walk upon thorns, but to have sound feet as thou hast decreed."

The priests did not neglect the natural means of healing. The inscriptions show that great attention was paid to diet, exercise, massage and bathing, and that when necessary, drugs were used. Birth and death were believed to defile the sacred precincts, and it was not until the time of the Antonines that provision was made at Epidaurus for these contingencies.

One practice of the temple was of special interest, viz., the incubation sleep, in which dreams were suggested to the patients. In the religion of Babylonia, an important part was played by the mystery of sleep, and the interpretation of dreams; and no doubt from the East the Greeks took over the practice of divination in sleep, for in the AEsculapian cult also, the incubation sleep played a most important role. That it continued in later times is well indicated in the orations of Aristides, the arch-neurasthenic of ancient history, who was a great dreamer of dreams. The oracle of Amphiaraus in Attica sent dreams into the hearts of his consultants. "The priests take the inquirer, and keep him fasting from food for one day, and from wine for three days, to give him perfect spiritual lucidity to absorb the divine communication" (Phillimore's "Apollonius of Tyana," Bk. II, Ch. XXXVII). How incubation sleep was carried into the Christian Church, its association with St. Cosmas and St. Damian and other saints, its practice throughout the Middle Ages, and its continuation to our own time may be read in the careful study of the subject made by Miss Hamilton (now Mrs. Dickens). There are still in parts of Greece and in Asia Minor shrines at which incubation is practiced regularly, and if one may judge from the reports, with as great success as in Epidaurus. At one place in Britain, Christchurch in Monmouthshire, incubation was carried on till the early part of the nineteenth century. Now the profession has come back to the study of dreams, and there are professors as ready to give suggestive interpretations to them, as in the days of Aristides. As usual, Aristotle seems to have said the last word on the subject: "Even scientific physicians tell us that one should pay diligent attention to dreams, and to hold this view is reasonable also for those who are not practitioners but speculative philosophers," but it is asking too much to think that the Deity would trouble to send dreams to very simple people and to animals, if they were designed in any way to reveal the future.

In its struggle with Christianity, Paganism made its last stand in the temples of Asklepios. The miraculous healing of the saints superseded the cures of the heathen god, and it was wise to adopt the useful practice of his temple.

HIPPOCRATES AND THE HIPPOCRATIC WRITINGS

DESERVEDLY the foundation of Greek Medicine is associated with the name of Hippocrates, a native of the island of Cos; and yet he is a shadowy personality, about whom we have little accurate first-hand information. This is in strong contrast to some of his distinguished contemporaries and successors, for example, Plato and Aristotle, about whom we have such full and accurate knowledge. You will, perhaps, be surprised to hear that the only contemporary mention of Hippocrates is made by Plato. In the "Protagoras," the young Hippocrates, son of Apollodorus has come to Protagoras, "that mighty wise man," to learn the science and knowledge of human life. Socrates asked him: "If . . . you had thought of going to Hippocrates of Cos, the Asclepiad, and were about to give him your money, and some one had said to you, You are paying money to your namesake Hippocrates, O Hippocrates; tell me, what is he that you give him money?' how would you have answered?" "I should say," he replied, "that I gave money to him as a physician." "And what will he make of you?" "A physician," he said. And in the Phaedrus, in reply to a question of Socrates whether the nature of the soul could be known intelligently without knowing the nature of the whole, Phaedrus replies: "Hippocrates, the Asclepiad, says that the nature, even of the body, can only be understood as a whole." (Plato, I, 311; III, 270 Jowett, I, 131, 479.)

Several lives of Hippocrates have been written. The one most frequently quoted is that of Soranus of Ephesus (not the famous physician of the time of Trajan), and the statements which he gives are usually accepted, viz., that he was born in the island of Cos in the year 460 B.C.; that he belonged to an Asklepiad family of distinction, that he travelled extensively, visiting Thrace, Thessaly, and various other parts of Greece; that he returned to Cos, where he became the most renowned physician of his period, and died about 375 B.C. Aristotle mentions him but once, calling him "the great Hippocrates." Busts of him are common; one of the earliest of which, and I am told the best, dating from Roman days and now in the British Museum, is here represented.

Of the numerous writings attributed to Hippocrates it cannot easily be determined which are really the work of the Father of Medicine himself. They were collected at the time of the Alexandrian School, and it became customary to write commentaries upon them; much of the most important information we have about them, we derive from Galen. The earliest manuscript is the "Codex Laurentianus" of Florence, dating from the ninth century, a specimen page of which (thanks to Commendatore Biagi) is annexed. Those of you who are interested, and wish to have full references to the various works attributed to Hippocrates, will find them in "Die Handschriften der antiken Aerzte" of the Prussian Academy, edited by Diels (Berlin, 1905). The Prussian Academy has undertaken the editorship of the "Corpus Medicorum Graecorum." There is no complete edition of them in English. In 1849 the Deeside physician, Adams, published (for the Old Sydenham Society) a translation of the most important works, a valuable edition and easily obtained. Littre's ten-volume edition "OEuvres completes d'Hippocrate," Paris, 1839-1861, is the most important for reference. Those of you who want a brief

but very satisfactory account of the Hippocratic writings, with numerous extracts, will find the volume of Theodor Beck (Jena, 1907) very useful.

I can only indicate, in a very brief way, the special features of the Hippocratic writings that have influenced the evolution of the science and art of medicine.

The first is undoubtedly the note of humanity. In his introduction to, "The Rise of the Greek Epic," Gilbert Murray emphasizes the idea of service to the community as more deeply rooted in the Greeks than in us. The question they asked about each writer was, "Does he help to make better men?" or "Does he make life a better thing?" Their aim was to be useful, to be helpful, to make better men in the cities, to correct life, "to make gentle the life of the world." In this brief phrase were summed up the aspirations of the Athenians, likewise illuminated in that remarkable saying of Prodicus (fifth century B.C.), "That which benefits human life is God." The Greek view of man was the very antithesis of that which St. Paul enforced upon the Christian world. One idea pervades thought from Homer to Lucian-like an aroma—pride in the body as a whole. In the strong conviction that "our soul in its rose mesh" is quite as much helped by flesh as flesh by the soul the Greek sang his song —"For pleasant is this flesh." Just so far as we appreciate the value of the fair mind in the fair body, so far do we apprehend ideals expressed by the Greek in every department of life. The beautiful soul harmonizing with the beautiful body was as much the glorious ideal of Plato as it was the end of the education of Aristotle. What a splendid picture in Book III of the "Republic," of the day when ". . . our youth will dwell in a land of health, amid fair sights and sounds and receive the good in everything; and beauty, the effluence of fair works, shall flow into the eye and ear like a health-giving breeze from a purer region, and insensibly draw the soul from earliest years into likeness and sympathy with the beauty of reason." The glory of this zeal for the enrichment of this present life was revealed to the Greeks as to no other people, but in respect to care for the body of the common man, we have only seen its fulfilment in our own day, as a direct result of the methods of research initiated by them. Everywhere throughout the Hippocratic writings we find this attitude towards life, which has never been better expressed than in the fine phrase, "Where there is love of humanity there will be love of the profession." This is well brought out in the qualifications laid down by Hippocrates for the study of medicine. "Whoever is to acquire a competent knowledge of medicine ought to be possessed of the following advantages: a natural disposition; instruction; a favourable position for the study; early tuition; love of labour; leisure. First of all, a natural talent is required, for when nature opposes, everything else is vain; but when nature leads the way to what is most excellent, instruction in the art takes place, which the student must try to appropriate to himself by reflection, becoming a nearly pupil in a place well adapted for instruction. He must also bring to the task a love of labour and perseverance, so that the instruction taking root may bring forth proper and abundant fruits." And the directions given for the conduct of life and for the relation which the physician should have with the public are those of our code of ethics today. Consultations in doubtful cases are advised, touting for fees is discouraged. "If two or more ways of medical treatment were possible, the physician

was recommended to choose the least imposing or sensational; it was an act of deceit' to dazzle the patient's eye by brilliant exhibitions of skill which might very well be dispensed with. The practice of holding public lectures in order to increase his reputation was discouraged in the physician, and he was especially warned against lectures tricked out with quotations from the poets. Physicians who pretended to infallibility in detecting even the minutest departure from their prescriptions were laughed at; and finally, there were precise by-laws to regulate the personal behaviour of the physician. He was enjoined to observe the most scrupulous cleanliness, and was advised to cultivate an elegance removed from all signs of luxury, even down to the detail that he might use perfumes, but not in an immoderate degree." But the high-water mark of professional morality is reached in the famous Hippocratic oath, which Gomperz calls "a monument of the highest rank in the history of civilization." It is of small matter whether this is of Hippocratic date or not, or whether it has in it Egyptian or Indian elements: its importance lies in the accuracy with which it represents the Greek spirit. For twenty-five centuries it has been the "credo" of the profession, and in many universities it is still the formula with which men are admitted to the doctorate.

I swear by Apollo the physician and AEsculapius and Health (Hygieia) and All-Heal (Panacea) and all the gods and goddesses, that, according to my ability and judgment, I will keep this oath and this stipulation to reckon him who taught me this art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my own brothers, and to teach them this art, if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of my art to my own sons, and those of my teachers, and to disciples bound by a stipulation and oath according to the law of medicine, but to none others. I will follow that system of regimen which, according to my ability and judgement, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous.

I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and in like manner I will not give to a woman a pessary to produce abortion.

With purity and with holiness I will pass my life and practice my art.

(I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work.)

Into whatsoever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption, and, further, from the abduction of females or males, of freemen and slaves. Whatever, in connection with my professional practice, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.

While I continue to keep this Oath unviolated, may it be granted to me to enjoy life and the practice of the art, respected by all men, in all times! But should I trespass and violate this Oath, may the reverse be my lot!

(Adams, II, 779, cf. Littre, IV, 628.)

In his ideal republic, Plato put the physician low enough, in the last stratum, indeed, but he has never been more honorably placed than in the picture of Athenian society given by this author in the "Symposium." Here the physician is shown as a cultivated gentleman, mixing in the best, if not always the most sober, society. Eryximachus, the son of Acumenus, himself a physician, plays in this famous scene a typical Greek part—a strong advocate of temperance in mind and body, deprecating, as a physician, excess in drink, he urged that conversation should be the order of the day and he had the honor of naming the subject—"Praise of the God of Love." Incidentally Eryximachus gives his view of the nature of disease, and shows how deeply he was influenced by the views of Empedocles:" . . . so too in the body the good and healthy elements are to be indulged, and the bad elements and the elements of disease are not to be indulged, but discouraged. And this is what the physician has to do, and in this the art of medicine consists: for medicine may be regarded generally as the knowledge of the loves and desires of the body and how to satisfy them or not; and the best physician is he who is able to separate fair love from foul, or to convert one into the other; and he who knows how to eradicate and how to implant love, whichever is required, and can reconcile the most hostile elements in the constitution and make them loving friends, is a skilful practitioner."

The second great note in Greek medicine illustrates the directness with which they went to the very heart of the matter. Out of mysticism, superstition and religious ritual the Greek went directly to nature and was the first to grasp the conception of medicine as an art based on accurate observation, and an integral part of the science of man. What could be more striking than the phrase in "The Law," "There are, in effect, two things, to know and to believe one knows; to know is science; to believe one knows is ignorance"? But no single phrase in the writings can compare for directness with the famous aphorism which has gone into the literature of all lands: "Life is short and Art is long; the Occasion fleeting, Experience fallacious, and Judgment difficult."

Everywhere one finds a strong, clear common sense, which refuses to be entangled either in theological or philosophical speculations. What Socrates did for philosophy Hippocrates may be said to have done for medicine. As Socrates devoted himself to ethics, and the application of right thinking to good conduct, so Hippocrates insisted upon the practical nature of the art, and in placing its highest good in the benefit of the patient. Empiricism, experience, the collection of facts, the evidence of the senses, the avoidance of philosophical speculations, were the distinguishing features of Hippocratic medicine. One of the most striking contributions of Hippocrates is the recognition that diseases are only part of the processes of nature, that there is nothing divine or sacred about them. With reference to epilepsy, which was regarded as a sacred disease, he says, "It appears to me to be no wise more divine nor more sacred than other diseases, but has a natural cause from which it originates like other affections; men regard its nature and cause as divine from ignorance." And in another place he remarks that each disease has its own nature, and that no one arises without a natural cause. He seems to have been the first to grasp the conception of the great healing powers of nature. In his

long experience with the cures in the temples, he must have seen scores of instances in which the god had worked the miracle through the vis medicatrix naturae; and to the shrewd wisdom of his practical suggestions in treatment may be attributed in large part the extraordinary vogue which the great Coan has enjoyed for twenty-five centuries. One may appreciate the veneration with which the Father of Medicine was regarded by the attribute "divine" which was usually attached to his name. Listen to this for directness and honesty of speech taken from the work on the joints characterized by Littre as "the great surgical monument of antiquity": "I have written this down deliberately, believing it is valuable to learn of unsuccessful experiments, and to know the causes of their non-success."

The note of freedom is not less remarkable throughout the Hippocratic writings, and it is not easy to understand how a man brought up and practicing within the precincts of a famous AEsculapian temple could have divorced himself so wholly from the superstitions and vagaries of the cult. There are probably grounds for Pliny's suggestion that he benefited by the receipts written in the temple, registered by the sick cured of any disease. "Afterwards," Pliny goes on to remark in his characteristic way, "hee professed that course of Physicke which is called Clinice Wherby physicians found such sweetnesse that afterwards there was no measure nor end of fees," (Natural History,' XXIX, 1). There is no reference in the Hippocratic writings to divination; incubation sleep is not often mentioned, and charms, incantations or the practice of astrology but rarely. Here and there we do find practices which jar upon modern feeling, but on the whole we feel in reading the Hippocratic writings nearer to their spirit than to that of the Arabians or of the many writers of the fifteenth and sixteenth centuries A. D. And it is not only against the thaumaturgic powers that the Hippocratic writings protested, but they express an equally active reaction against the excesses and defects of the new philosophy, a point brought out very clearly by Gomperz. He regards it as an undying glory of the school of Cos that after years of vague, restless speculation it introduces "steady sedentary habits into the intellectual life of mankind." Fiction to the right! Reality to the left!' was the battle-cry of this school in the war they were the first to wage against the excesses and defects of the nature-philosophy. Though the protest was effective in certain directions, we shall see that the authors of the Hippocratic writings could not entirely escape from the hypotheses of the older philosophers.

I can do no more than indicate in the briefest possible way some of the more important views ascribed to Hippocrates. We cannot touch upon the disputes between the Coan and Cnidian schools. You must bear in mind that the Greeks at this time had no human anatomy. Dissections were impossible; their physiology was of the crudest character, strongly dominated by the philosophies. Empedocles regarded the four elements, fire, air, earth and water, as "the roots of all things," and this became the corner stone in the humoral pathology of Hippocrates. As in the Macrocosm the world at large there were four elements, fire, air, earth, and water, so in the Microcosm the world of man's body— there were four humors (elements), viz.,blood, phlegm, yellow bile (or choler) and black bile (or melancholy), and they corresponded to the

four qualities of matter, heat, cold, dryness and moisture. For more than two thousand years these views prevailed. In his "Regiment of Life" (1546) Thomas Phaer says:" . . . which humours are called ye sones of the Elements because they be complexioned like the foure Elements, for like as the Ayre is hot and moyst: so is the blooud, hote and moyste. And as Fyer is hote and dry: so is Cholere hote and dry. And as water is colde and moyst: so is fleume colde and moyste. And as the Earth is colde and dry: so Melancholy is colde and dry."

As the famous Regimen Sanitatis of Salernum, the popular family hand-book of the Middle Ages, says:

> Foure Humours raigne within our bodies wholly,
> And these compared to foure elements.

According to Littre, there is nowhere so strong a statement of these views in the genuine works of Hippocrates, but they are found at large in the Hippocratic writings, and nothing can be clearer than the following statement from the work "The Nature of Man": "The body of man contains in itself blood and phlegm and yellow bile and black bile, which things are in the natural constitution of his body, and the cause of sickness and of health. He is healthy when they are in proper proportion between one another as regards mixture and force and quantity, and when they are well mingled together; he becomes sick when one of these is diminished or increased in amount, or is separated in the body from its proper mixture, and not properly mingled with all the others." No words could more clearly express the views of disease which, as I mentioned, prevailed until quite recent years. The black bile, melancholy, has given us a great word in the language, and that we have not yet escaped from the humoral pathology of Hippocrates is witnessed by the common expression of biliousness "too much bile" or "he has a touch of the liver." The humors, imperfectly mingled, prove irritant in the body. They are kept in due proportion by the innate heat which, by a sort of internal coction gradually changes the humors to their proper proportion. Whatever may be the primary cause of the change in the humors manifesting itself in disease, the innate heat, or as Hippocrates terms it, the nature of the body itself, tends to restore conditions to the norm; and this change occurring suddenly, or abruptly, he calls the "crisis," which is accomplished on some special day of the disease, and is often accompanied by a critical discharge, or by a drop in the body temperature. The evil, or superabundant, humors were discharged and this view of a special materies morbi, to be got rid of by a natural processor a crisis, dominated pathology until quite recently. Hippocrates had a great belief in the power of nature, the vis medicatrix naturae, to restore the normal state. A keen observer and an active practitioner, his views of disease, thus hastily sketched, dominated the profession for twenty-five centuries; indeed, echoes of his theories are still heard in the schools, and his very words are daily on our lips. If asked what was the great contribution to medicine of Hippocrates and his school we could answer—the art of careful observation.

In the Hippocratic writings is summed up the experience of Greece to the Golden Age of Pericles. Out of philosophy, out of abstract speculation, had come a way of looking at nature for which the physicians were mainly responsible, and which has changed forever men's views on disease. Medicine broke its leading strings to religion and philosophy—a tottering, though lusty, child whose fortunes we are to follow in these lectures. I have a feeling that, could we know more of the medical history of the older races of which I spoke in the first lecture, we might find that this was not the first-born of Asklepios, that there had been many premature births, many still-born offspring, even live-births—the products of the fertilization of nature by the human mind; but the record is dark, and the infant was cast out like Israel in the chapter of Isaiah. But the high-water mark of mental achievement had not been reached by the great generation in which Hippocrates had labored. Socrates had been dead sixteen years, and Plato was a man of forty-five, when far away in the north in the little town of Stagira, on the peninsula of Mount Athos in Macedoniawas, in 384 B.C., born a "man of men," the one above all others to whom the phrase of Milton may be applied. The child of an Asklepiad, Nicomachus, physician to the father of Philip, there must have been a rare conjunction of the planets at the birth of the great Stagirite. In the first circle of the "Inferno," Virgil leads Dante into a wonderful company, "star-seated" on the verdure (he says)—the philosophic family looking with reverence on "the Master of those who know"—il maestro di color che sanno. And with justice has Aristotle been so regarded for these twenty-three centuries. No man has ever swayed such an intellectual empire—in logic, metaphysics, rhetoric, psychology, ethics, poetry, politics and natural history, in all a creator, and in all still a master. The history of the human mind—offers no parallel to his career. As the creator of the sciences of comparative anatomy, systematic zoology, embryology, teratology, botany and physiology, his writings have an eternal interest. They present an extraordinary accumulation of facts relating to the structure and functions of various parts of the body. It is an unceasing wonder how one man, even with a school of devoted students, could have done so much.

Dissection—already practiced by Alcmaeon, Democritus, Diogenes and others—was conducted on a large scale, but the human body was still taboo. Aristotle confesses that the "inward parts of man are known least of all," and he had never seen the human kidneys or uterus. In his physiology, I can refer to but one point—the pivotal question of the heart and blood vessels. To Aristotle the heart was the central organ controlling the circulation, the seat of vitality, the source of the blood, the place in which it received its final elaboration and impregnation with animal heat. The blood was contained in the heart and vessels as in a vase—hence the use of the term "vessel." "From the heart the blood-vessels extend throughout the body as in the anatomical diagrams which are represented on the walls, for the parts lie round these because they are formed out of them." The nutriment oozes through the blood vessels and the passages in each of the parts "like water in unbaked pottery." He did not recognize any distinction between arteries and veins, calling both plebes (Littre); the vena cave is the great vessel, and the aorta the smaller; but both

contain blood. He did not use the word "arteria" (arthria) for either of them. There was no movement from the heart to the vessels but the blood was incessantly drawn upon by the substance of the body and as unceasingly renewed by absorption of the products of digestion, the mesenteric vessels taking up nutriment very much as the plants take theirs by the roots from the soil. From the lungs was absorbed the pneuma, or spiritus, which was conveyed to the heart by the pulmonary vessels—one to the right, and one to the left side. These vessels in the lungs, "through mutual contact" with the branches of the trachea, took in the pneuma. A point of interest is that the windpipe, or trachea, is called "arteria," both by Aristotle and by Hippocrates ("Anatomy," Littre, VIII, 539). It was the air-tube, disseminating the breath through the lungs. We shall see in a few minutes how the term came to be applied to the arteries, as we know them. The pulsation of the heart and arteries was regarded by Aristotle as a sort of ebullition in which the liquids were inflated by the vital or innate heat, the fires of which were cooled by the pneuma taken in by the lungs and carried to the heart by the pulmonary vessels.

In Vol. IV of Gomperz' "Greek Thinkers," you will find an admirable discussion on Aristotle as an investigator of nature, and those of you who wish to study his natural history works more closely may do so easily—in the new translation which is in process of publication by the Clarendon Press, Oxford. At the end of the chapter "De Respiratione" in the "Parva Naturalia" (Oxford edition, 1908), we have Aristotle's attitude towards medicine expressed in a way worthy of a son of the profession:

> "But health and disease also claim the attention of the scientist, and not merely of the physician, in so far as an account of their causes is concerned. The extent to which these two differ and investigate diverse provinces must not escape us, since facts show that their inquiries are, at least to a certain extent, conterminous. For physicians of culture and refinement make some mention of natural science, and claim to derive their principles from it, while the most accomplished investigators into nature generally push their studies so far as to conclude with an account of medical principles." (Works, III,480 b.)

Theophrastus, a student of Aristotle and his successor, created the science of botany and made possible the pharmacologists of a few centuries later. Some of you doubtless know him in another guise—as the author of the golden booklet on "Characters," in which "the most eminent botanist of antiquity observes the doings of men with the keen and unerring vision of a natural historian" (Gomperz). In the Hippocratic writings, there are mentioned 236 plants; in the botany of Theophrastus, 455. To one trait of master and pupil I must refer—the human feeling, not alone of man for man, but a sympathy that even claims kinship with the animal world. "The spirit with which he (Theophrastus) regarded the animal world found no second expression till the present age" (Gomperz). Halliday, however, makes the statement that Porphyry goes as far as any modern humanitarian in preaching our duty towards animals.

ALEXANDRIAN SCHOOL

FROM the death of Hippocrates about the year 375 B.C. till the founding of the Alexandrian School, the physicians were engrossed largely in speculative views, and not much real progress was made, except in the matter of elaborating the humoral pathology. Only three or four men of the first rank stand out in this period: Diocles the Carystian, "both in time and reputation next and second to Hippocrates" (Pliny), a keen anatomist and an encyclopaedic writer; but only scanty fragments of his work remain. In some ways the most important member of this group was Praxagoras, a native of Cos, about 340 B.C. Aristotle, you remember, made no essential distinction between arteries and veins, both of which he held to contain blood: Praxagoras recognized that the pulsation was only in the arteries, and maintained that only the veins contained blood, and the arteries air. As a rule the arteries are empty after death, and Praxagoras believed that they were filled with an aeriform fluid, a sort of pneuma, which was responsible for their pulsation. The word arteria, which had already been applied to the trachea, as an air-containing tube, was then attached to the arteries; on account of the rough and uneven character of its walls the trachea was then called the arteria tracheia, or the rough air-tube. We call it simply the trachea, but in French the word trachee-artere is still used.

Praxagoras was one of the first to make an exhaustive study of the pulse, and he must have been a man of considerable clinical acumen, as well as boldness, to recommend in obstruction of the bowels the opening of the abdomen, removal of the obstructed portion and uniting the ends of the intestine by sutures.

After the death of Alexander, Egypt fell into the hands of his famous general, Ptolemy, under whose care the city became one of the most important on the Mediterranean. He founded and maintained a museum, an establishment that corresponded very much to a modern university, for the study of literature, science and the arts. Under his successors, particularly the third Ptolemy, the museum developed, more especially the library, which contained more than half a million volumes. The teachers were drawn from all centres, and the names of the great Alexandrians are among the most famous in the history of human knowledge, including such men as Archimedes, Euclid, Strabo and Ptolemy.

In mechanics and physics, astronomy, mathematics and optics, the work of the Alexandrians constitutes the basis of a large part of our modern knowledge. The school-boy of today—or at any rate of my day—studies the identical problems that were set by Euclid 300 B.C., and the student of physics still turns to Archimedes and Heron, and the astronomer to Eratosthenes and Hipparchus. To those of you who wish to get a brief review of the state of science in the Alexandrian School I would recommend the chapter in Vol. I of Dannemann's history.

Of special interest to us in Alexandria is the growth of the first great medical school of antiquity. Could we have visited the famous museum about 300 B.C., we should have found a medical school in full operation, with extensive laboratories, libraries and clinics. Here for the first time the study of the structure of the human body reached its full development, till then barred everywhere by religious prejudice;

but full permission was given by the Ptolemies to perform human dissection and, if we may credit some authors, even vivisection. The original writings of the chief men of this school have not been preserved, but there is a possibility that any day a papyrus maybe found which will supplement the scrappy and imperfect knowledge afforded us by Pliny, Celsus and Galen. The two most distinguished names are Herophilus— who, Pliny says, has the honor of being the first physician "who searched into the causes of disease"—and Erasistratus.

Herophilus, ille anatomicorum coryphaeus, as Vesalius calls him, was a pupil of Praxagoras, and his name is still in everyday use by medical students, attached to the torcular Herophili. Anatomy practically dates from these Alexandrines, who described the valves of the heart, the duodenum, and many of the important parts of the brain; they recognized the true significance of the nerves (which before their day had been confounded with the tendons), distinguished between motor and sensory nerves, and regarded the brain as the seat of the perceptive faculties and voluntary action. Herophilus counted the pulse, using the water-clock for the purpose, and made many subtle analyses of its rate and rhythm; and, influenced by the musical theories of the period, he built up a rhythmical pulse lore which continued in medicine until recent times. He was a skilful practitioner and to him is ascribed the statement that drugs are the hands of the gods. There is a very modern flavor to his oft-quoted expression that the best physician was the man who was able to distinguish between the possible and the impossible.

Erasistratus elaborated the view of the pneuma, one form of which he believed came from the inspired air, and passed to the left side of the heart and to the arteries of the body. It was the cause of the heart-beat and the source of the innate heat of the body, and it maintained the processes of digestion and nutrition. This was the vital spirit; the animal spirit was elaborated in the brain, chiefly in the ventricles, and sent by the nerves to all parts of the body, endowing the individual with life and perception and motion. In this way a great division was made between the two functions of the body, and two sets of organs: in the vascular system, the heart and arteries and abdominal organs, life was controlled by the vital spirits; on the other hand, in the nervous system were elaborated the animal spirits, controlling motion, sensation and the various special senses. These views on the vital and animal spirits held unquestioned sway until well into the eighteenth century, and we still, in a measure, express the views of the great Alexandrian when we speak of "high" or "low" spirits.

GALEN

PERGAMON has become little more than a name associated in our memory with the fulminations of St. John against the seven churches of Asia; and on hearing the chapter read, we wondered what was "Satan's seat" and who were the "Nicolaitanes" whose doctrine he so hated. Renewed interest has been aroused in the story of its growth and of its intellectual rivalry with Alexandria since the wonderful discoveries by German archaeologists which have enabled us actually to see this great Ionian capital, and even

the "seat of Satan." The illustration here shown is of the famous city, in which you can see the Temple of Athena Polis on the rock, and the amphitheatre. Its interest for us is connected with the greatest name, after Hippocrates, in Greek medicine, that of Galen, born at Pergamon A. D. 130, in whom was united as never before—and indeed one may say, never since—the treble combination of observer, experimenter and philosopher. His father, Nikon, a prosperous architect, was urged in a dream to devote his son to the profession of medicine, upon which study the lad entered in his seventeenth year under Satyrus. In his writings, Galen gives many details of his life, mentioning the names of his teachers, and many incidents in his Wanderjahre, during which he studied at the best medical schools, including Alexandria. Returning to his native city he was put in charge of the gladiators, whose wounds he said he treated with wine. In the year 162, he paid his first visit to Rome, the scene of his greatest labors. Here he gave public lectures on anatomy, and became "the fashion." He mentions many of his successes; one of them is the well-worn story told also of Erasistratus and Stratonice, but Galen's story is worth telling, and it is figured as a miniature in the manuscripts of his works. Called to see a lady he found her suffering from general malaise without any fever or increased action of the pulse. He saw at once that her trouble was mental and, like a wise physician, engaged her in general conversation. Quite possibly he knew her story, for the name of a certain actor, Pylades, was mentioned, and he noticed that her pulse at once increased in rapidity and became irregular. On the next day he arranged that the name of another actor, Morphus, should be mentioned, and on the third day the experiment was repeated but without effect. Then on the fourth evening it was again mentioned that Pylades was dancing, and the pulse quickened and became irregular, so he concluded that she was in love with Pylades. He tells how he was first called to treat the Emperor Marcus Aurelius, who had a stomach-ache after eating too much cheese. He treated the case so successfully that the Emperor remarked, "I have but one physician, and he is a gentleman." He seems to have had good fees, as he received 400 aurei (about 2000) for a fortnight's attendance upon the wife of Boethus.

He left Rome for a time in 168 A. D. and returned to Pergamon, but was recalled to Rome by the Emperor, whom he accompanied on an expedition to Germany. There are records in his writings of many journeys, and busy with his practice in dissections and experiments he passed a long and energetic life, dying, according to most authorities, in the year 200 A.D.

A sketch of the state of medicine in Rome is given by Celsus in the first of his eight books, and he mentions the names of many of the leading practitioners, particularly Asclepiades, the Bithynian, a man of great ability, and a follower of the Alexandrians, who regarded all disease as due to a disturbed movement of the atoms. Diet, exercise, massage and bathing were his great remedies, and his motto—tuto, cito et jucunde—has been the emulation of all physicians. How important a role he and his successors played until the time of Galen may be gathered from the learned lectures of Sir Clifford Allbutt on "Greek Medicine in Rome" and from Meyer-Steineg's "Theodorus Priscianus und die romische Medizin." From certain lay writers we learn that it was the custom for popular

physicians to be followed on their rounds by crowds of students. Martial's epigram (V, ix) is often referred to:

> Languebam: sed tu comitatus protinus ad me
> Venisti centum, Symmache, discipulis.
> Centum me tegigere manus Aquilone gelatae
> Non habui febrem, Symmache, nunc habeo.

And in the "Apollonius of Tyana" by Philostratus, when Apollonius wishes to prove an alibi, he calls to witness the physicians of his sick friend, Seleucus and Straloctes, who were accompanied by their clinical class to the number of about thirty students. But for a first-hand sketch of the condition of the profession we must go to Pliny, whose account in the twenty-ninth book of the "Natural History" is one of the most interesting and amusing chapters in that delightful work. He quotes Cato's tirade against Greek physicians,—corrupters of the race, whom he would have banished from the city,—then he sketches the career of some of the more famous of the physicians under the Empire, some of whom must have had incomes never approached at any other period in the history of medicine. The chapter gives a good picture of the stage on which Galen (practically a contemporary of Pliny) was to play so important a role. Pliny seems himself to have been rather disgusted with the devious paths of the doctors of his day, and there is no one who has touched with stronger language upon the weak points of the art of physic. In one place he says that it alone has this peculiar art and privilege, "That whosoever professeth himself a physician, is straightwaies beleeved, say what he will: and yet to speake a truth, there are no lies dearer sold or more daungerous than those which proceed out of a Physician's mouth. Howbeit, we never once regard or look to that, so blind we are in our deepe persuasion of them, and feed our selves each one in a sweet hope and plausible conceit of our health by them. Moreover, this mischief there is besides, That there is no law or statute to punish the ignorance of blind Physicians, though a man lost his life by them: neither was there ever any man knowne, who had revenge of recompence for the evill intreating or misusage under their hands. They learne their skill by endaungering our lives: and to make proofe and experiments of their medicines, they care not to kill us." He says it is hard that, while the judges are carefully chosen and selected, physicians are practically their own judges, and that of the men who may give us a quick despatch and send us to Heaven or Hell, no enquiry or examination is made of their quality and worthiness. It is interesting to read so early a bitter criticism of the famous "Theriaca," a great compound medicine invented by Antiochus III, which had a vogue for fifteen hundred years.

But we must return to Galen and his works, which comprise the most voluminous body of writings left by any of the ancients. The great edition is that in twenty-two volumes by Kuhn (1821-1833). The most useful editions are the "Juntines" of Venice, which were issued in thirteen editions. In the fourth and subsequent editions a very useful index by Brassavola is included. A critical study of the writings is at present

being made by German scholars for the Prussian Academy, which will issue a definitive edition of his works.

Galen had an eclectic mind and could not identify himself with any of the prevailing schools, but regarded himself as a disciple of Hippocrates. For our purpose, both his philosophy and his practice are of minor interest in comparison with his great labors in anatomy and physiology.

In anatomy, he was a pupil of the Alexandrians to whom he constantly refers. Times must have changed since the days of Herophilus, as Galen does not seem ever to have had an opportunity of dissecting the human body, and he laments the prejudice which prevents it. In the study of osteology, he urges the student to be on the lookout for an occasional human bone exposed in a graveyard, and on one occasion he tells of finding the carcass of a robber with the bones picked bare by birds and beasts. Failing this source, he advises the student to go to Alexandria, where there were still two skeletons. He himself dissected chiefly apes and pigs. His osteology was admirable, and his little tractate "De Ossibus" could, with very few changes, be used today by a hygiene class as a manual. His description of the muscles and of the organs is very full, covering, of course, many sins of omission and of commission, but it was the culmination of the study of the subject by Greek physicians.

His work as a physiologist was even more important, for, so far as we know, he was the first to carry out experiments on a large scale. In the first place, he was within an ace of discovering the circulation of the blood. You may remember that through the errors of Praxagoras and Erasistratus, the arteries were believed to contain air and got their name on that account: Galen showed by experiment that the arteries contain blood and not air. He studied particularly the movements of the heart, the action of the valves, and the pulsatile forces in the arteries. Of the two kinds of blood, the one, contained in the venous system, was dark and thick and rich in grosser elements, and served for the general nutrition of the body. This system took its origin, as is clearly shown in the figure, in the liver, the central organ of nutrition and of sanguification. From the portal system were absorbed, through the stomach and intestines, the products of digestion. From the liver extend the venae cavae, one to supply the head and arms, the other the lower extremities: extending from the right heart was a branch, corresponding to the pulmonary artery, the arterial vein which distributed blood to the lungs. This was the closed venous system. The arterial system, shown, as you see, quite separate in Figure 31, was full of a thinner, brighter, warmer blood, characterized by the presence of an abundance of the vital spirits. Warmed in the ventricle, it distributed vital heat to all parts of the body. The two systems were closed and communicated with each other only through certain pores or perforations in the septum separating the ventricles. At the periphery, however, Galen recognized (as had been done already by the Alexandrians) that the arteries anastomose with the veins, ". . . and they mutually receive from each other blood and spirits through certain invisible and extremely small vessels."

It is difficult to understand how Galen missed the circulation of the blood. He knew that the valves of the heart determined the direction of the blood that entered and left the

organ, but he did not appreciate that it was a pump for distributing the blood, regarding it rather as a fireplace from which the innate heat of the body was derived. He knew that the pulsatile force was resident in the walls of the heart and in the arteries, and he knew that the expansion, or diastole, drew blood into its cavities, and that the systole forced blood out. Apparently his view was that there was a sort of ebb and flow in both systems—and yet, he uses language just such as we would, speaking of the venous system as ". . . a conduit full of blood with a multitude of canals large and small running out from it and distributing blood to all parts of the body." He compares the mode of nutrition to irrigating canals and gardens, with a wonderful dispensation by nature that they should "neither lack a sufficient quantity of blood for absorption nor be overloaded at any time with excessive supply." The function of respiration was the introduction of the pneuma, the spirits which passed from the lungs to the heart through the pulmonary vessels. Galen went a good deal beyond the idea of Aristotle, reaching our modern conception that the function is to maintain the animal heat, and that the smoky matters derived from combustion of the blood are discharged by expiration.

I have dwelt on these points in Galen's physiology, as they are fundamental in the history of the circulation; and they are sufficient to illustrate his position. Among his other brilliant experiments were the demonstration of the function of the laryngeal nerves, of the motor and sensory functions of the spinal nerve roots, of the effect of transverse incision of the spinal cord, and of the effect of hemisection. Altogether there is no ancient physician in whose writings are contained so many indications of modern methods of research.

Galen's views of disease in general are those of Hippocrates, but he introduces many refinements and subdivisions according to the predominance of the four humors, the harmonious combination of which means health, or eucrasia, while their perversion or improper combination leads to dyscrasia, or ill health. In treatment he had not the simplicity of Hippocrates: he had great faith in drugs and collected plants from all parts of the known world, for the sale of which he is said to have had a shop in the neighborhood of the Forum. As I mentioned, he was an eclectic, held himself aloof from the various schools of the day, calling no man master save Hippocrates. He might be called a rational empiricist. He made war on the theoretical practitioners of the day, particularly the Methodists, who, like some of their modern followers, held that their business was with the disease and not with the conditions out of which it arose.

No other physician has ever occupied the commanding position of "Clarissimus" Galenus. For fifteen centuries he dominated medical thought as powerfully as did Aristotle in the schools. Not until the Renaissance did daring spirits begin to question the infallibility of this medical pope. But here we must part with the last and, in many ways, the greatest of the Greeks—a man very much of our own type, who, could he visit this country today, might teach us many lessons. He would smile in scorn at the water supply of many of our cities, thinking of the magnificent aqueducts of Rome and of many of the colonial towns—some still in use—which in lightness of structure and in durability testify to the astonishing skill of their engineers. There are country districts

in which he would find imperfect drainage and could tell of the wonderful system by which Rome was kept sweet and clean. Nothing would delight him more than a visit to Panama to see what the organization of knowledge has been able to accomplish. Everywhere he could tour the country as a sanitary expert, preaching the gospel of good water supply and good drainage, two of the great elements in civilization, in which in many places we have not yet reached the Roman standard.

CHAPTER III MEDIAEVAL MEDICINE

THERE are waste places of the earth which fill one with terror not simply because they are waste; one has not such feelings in the desert nor in the vast solitude of the ocean. Very different is it where the desolation has overtaken a brilliant and flourishing product of man's head and hand. To know that . . . the Lion and the Lizard keepThe Courts where Jamshyd gloried and drank deep sends a chill to the heart, and one trembles with a sense of human instability. With this feeling we enter the Middle Ages. Following the glory that was Greece and the grandeur that was Rome, a desolation came upon the civilized world, in which the light of learning burned low, flickering almost to extinction. How came it possible that the gifts of Athens and of Alexandria were deliberately thrown away? For three causes. The barbarians shattered the Roman Empire to its foundations. When Alaric entered Rome in 410 A. D., ghastly was the impression made on the contemporaries; the Roman world shuddered in a titanic spasm (Lindner). The land was a garden of Eden before them, behind a howling wilderness, as is so graphically told in Gibbon's great history. Many of the most important centres of learning were destroyed, and for centuries Minerva and Apollo forsook the haunts of men. The other equally important cause was the change wrought by Christianity. The brotherhood of man, the care of the body, the gospel of practical virtues formed the essence of the teaching of the Founder in these the Kingdom of Heaven was to be sought; in these lay salvation. But the world was very evil, all thought that the times were waxing late, and into men's minds entered as never before a conviction of the importance of the four last things—death, judgment, heaven and hell. One obstacle alone stood between man and his redemption, the vile body, "this muddy vesture of decay," that so grossly wrapped his soul. To find methods of bringing it into subjection was the task of the Christian Church for centuries. In the Vatican Gallery of Inscriptions is a stone slab with the single word "Stercoriae," and below, the Christian symbol. It might serve as a motto for the Middle Ages, during which, to quote St. Paul, all things were "counted dung but to win Christ." In this attitude of mind the wisdom of the Greeks was not simply foolishness, but a stumbling-block in the path. Knowledge other than that which made a man "wise unto salvation" was useless. All that was necessary was contained in the Bible or taught by the Church. This simple creed brought consolation to thousands and illumined the lives of some of the noblest of men. But, "in seeking a heavenly home man lost his bearings upon earth." Let me commend for your reading Taylor's "Mediaeval Mind." I cannot judge of its scholarship, which I am told by scholars is ripe and good, but I can judge of

its usefulness for anyone who wishes to know the story of the mind of man in Europe at this period. Into the content of mediaeval thought only a mystic can enter with full sympathy. It was a needful change in the evolution of the race. Christianity brought new ideals and new motives into the lives of men. The world's desire was changed, a desire for the Kingdom of Heaven, in the search for which the lust of the flesh, the lust of the eye and the pride of life were as dross. A master-motive swayed the minds of sinful men and a zeal to save other souls occupied the moments not devoted to the perfection of their own. The new dispensation made any other superfluous. As Tertullian said: Investigation since the Gospel is no longer necessary. (Dannemann, Die Naturw., I, p. 214.) The attitude of the early Fathers toward the body is well expressed by Jerome. "Does your skin roughen without baths? Who is once washed in the blood of Christ needs not wash again." In this unfavorable medium for its growth, science was simply disregarded, not in any hostile spirit, but as unnecessary. And a third contributing factor was the plague of the sixth century, which desolated the whole Roman world. On the top of the grand mausoleum of Hadrian, visitors at Rome see the figure of a gilded angel with a drawn sword, from which the present name of the Castle of St. Angelo takes its origin. On the twenty-fifth of April, 590, there set out from the Church of SS. Cosmas and Damian, already the Roman patron saints of medicine, a vast procession, led by St. Gregory the Great, chanting a seven-fold litany of intercession against the plague. The legend relates that Gregory saw on the top of Hadrian's tomb an angel with a drawn sword, which he sheathed as the plague abated.

Galen died about 200 A.D.; the high-water mark of the Renaissance, so far as medicine is concerned, was reached in the year 1542. In order to traverse this long interval intelligently, I will sketch certain great movements, tracing the currents of Greek thought, setting forth in their works the lives of certain great leaders, until we greet the dawn of our own day.

After flowing for more than a thousand years through the broad plain of Greek civilization, the stream of scientific medicine which we have been following is apparently lost in the morass of the Middle Ages; but, checked and blocked like the White Nile in the Soudan, three channels may be followed through the weeds of theological and philosophical speculation.

SOUTH ITALIAN SCHOOL

A WIDE stream is in Italy, where the "antique education never stopped, antique reminiscence and tradition never passed away, and the literary matter of the pagan past never faded from the consciousness of the more educated among the laity and clergy." Greek was the language of South Italy and was spoken in some of its eastern towns until the thirteenth century. The cathedral and monastic schools served to keep alive the ancient learning. Monte Casino stands pre-eminent as a great hive of students, and to the famous Regula of St. Benedict(4) we are indebted for the preservation of many precious manuscripts.

The Norman Kingdom of South Italy and Sicily was a meeting ground of Saracens, Greeks and Lombards. Greek, Arabic and Latin were in constant use among the people of the capital, and Sicilian scholars of the twelfth century translated directly from the Greek.

The famous "Almagest" of Ptolemy, the most important work of ancient astronomy, was translated from a Greek manuscript, as early as 1160, by a medical student of Salerno.

About thirty miles southeast of Naples lay Salernum, which for centuries kept alight the lamp of the old learning, and became the centre of medical studies in the Middle Ages; well deserving its name of "Civitas Hippocratica." The date of foundation is uncertain, but Salernitan physicians are mentioned as early as the middle of the ninth century, and from this date until the rise of the universities it was not only a great medical school, but a popular resort for the sick and wounded. As the scholar says in Longfellow's "Golden Legend":

> Then at every season of the year
> There are crowds of guests and travellers here;
> Pilgrims and mendicant friars and traders
> From the Levant, with figs and wine,
> And bands of wounded and sick Crusaders,
> Coming back from Palestine.

There were medical and surgical clinics, foundling hospitals, Sisters of Charity, men and women professors—among the latter the famous Trotula—and apothecaries. Dissections were carried out, chiefly upon animals, and human subjects were occasionally used. In the eleventh and twelfth centuries, the school reached its height, and that remarkable genius, Frederick II, laid down regulations for a preliminary study extending over three years, and a course in medicine for five years, including surgery. Fee tables and strict regulations as to practice were made; and it is specifically stated that the masters were to teach in the schools, theoretically and practically, under the authority of Hippocrates and Galen. The literature from the school had a far-reaching influence. One book on the anatomy of the pig illustrates the popular subject for dissection at that time. The writings, which are numerous, have been collected by De Renzi.

The "Antidotarium" of Nicolaus Salernitanus, about 1100, became the popular pharmacopoeia of the Middle Ages, and many modern preparations may be traced to it.

The most prominent man of the school is Constantinus Africanus, a native of Carthage, who, after numerous journeys, reached Salernum about the middle of the eleventh century. He was familiar with the works both of the Greeks and of the Arabs, and it was largely through his translations that the works of Rhazes and Avicenna became known in the West.

One work above all others spread the fame of the school—the Regimen Sanitatis, or Flos Medicinae as it is sometimes called, a poem on popular medicine. It is dedicated to

Robert of Normandy, who had been treated at Salernum, and the lines begin: "Anglorum regi scripsit schola tota Salerni . . ." It is a hand-book of diet and household medicine, with many shrewd and taking sayings which have passed into popular use, such as "Joy, temperance and repose Slam the door on the doctor's nose." A full account of the work and the various editions of it is given by Sir Alexander Croke, and the Finlayson lecture (Glasgow Medical Journal, 1908) by Dr. Norman Moore gives an account of its introduction into the British Isles.

BYZANTINE MEDICINE

THE second great stream which carried Greek medicine to modern days runs through the Eastern Empire. Between the third century and the fall of Constantinople there was a continuous series of Byzantine physicians whose inspiration was largely derived from the old Greek sources. The most distinguished of these was Oribasius, a voluminous compiler, a native of Pergamon and so close a follower of his great townsman that he has been called "Galen's ape." He left many works, an edition of which was edited by Bussemaker and Daremberg. Many facts relating to the older writers are recorded in his writings. He was a contemporary, friend as well as the physician, of the Emperor Julian, for whom he prepared an encyclopaedia of the medical sciences.

Other important Byzantine writers were Aetius and Alexander of Tralles, both of whom were strongly under the influence of Galen and Hippocrates. Their materia medica was based largely upon Dioscorides.

From Byzantium we have the earliest known complete medical manuscript, dating from the fifth century—a work of Dioscorides—one of the most beautiful in existence. It was prepared for Anicia Juliana, daughter of the Emperor of the East, and is now one of the great treasures of the Imperial Library at Vienna. From those early centuries till the fall of Constantinople there is very little of interest medically. A few names stand out prominently, but it is mainly a blank period in our records. Perhaps one man may be mentioned, as he had a great influence on later ages Actuarius, who lived about 1300, and whose book on the urine laid the foundation of much of the popular uroscopy and water-casting that had such a vogue in the sixteenth and seventeenth centuries. His work on the subject passed through a dozen Latin editions, but is best studied in Ideler's "Physici et medici Graeci minores" (Berlin, 1841).

The Byzantine stream of Greek medicine had dwindled to a very tiny rill when the fall of Constantinople (1453) dispersed to the West many Greek scholars and many precious manuscripts.

ARABIAN MEDICINE

THE third and by far the strongest branch of the Greek river reached the West after a remarkable and meandering course. The map before you shows the distribution of the Graeco-Roman Christian world at the beginning of the seventh century. You will notice

that Christianity had extended far eastwards, almost to China. Most of those eastern Christians were Nestorians and one of their important centres was Edessa, whose school of learning became so celebrated. Here in the fifth century was built one of the most celebrated hospitals of antiquity.

Now look at another map showing the same countries about a century later. No such phenomenal change ever was made within so short space of time as that which thus altered the map of Asia and Europe at this period. Within a century, the Crescent had swept from Arabia through the Eastern Empire, over Egypt, North Africa and over Spain in the West, and the fate of Western Europe hung in the balance before the gates of Tours in 732. This time the barbaric horde that laid waste a large part of Christendom were a people that became deeply appreciative of all that was best in Graeco-Roman civilization and of nothing more than of its sciences. The cultivation of medicine was encouraged by the Arabs in a very special way. Anyone wishing to follow the history of the medical profession among this remarkable people will find it admirably presented in Lucien Leclerc's "Histoire de la medecine arabe" (Paris, 1876). An excellent account is also given in Freind's well-known "History of Medicine" (London, 1725-1726). Here I can only indicate very briefly the course of the stream and its freightage.

With the rise of Christianity, Alexandria became a centre of bitter theological and political factions, the story of which haunts the memory of anyone who was so fortunate as to read in his youth Kingsley's "Hypatia." These centuries, with their potent influence of neoplatonism on Christianity, appear to have been sterile enough in medicine. I have already referred to the late Greeks, Aetius and Alexander of Tralles. The last of the Alexandrians was a remarkable man, Paul of AEgina, a great name in medicine and in surgery, who lived in the early part of the seventh century. He also, like Oribasius, was a great compiler. In the year 640, the Arabs took Alexandria, and for the third time a great library was destroyed in the "first city of the West." Shortly after the conquest of Egypt, Greek works were translated into Arabic, often through the medium of Syriac, particularly certain of Galen's books on medicine, and chemical writings, which appear to have laid the foundation of Arabian knowledge on this subject.

Through Alexandria then was one source: but the special development of the Greek science and of medicine took place in the ninth century under the Eastern Caliphates. Let me quote here a couple of sentences from Leclerc (Tome I, pp. 91-92):

"The world has but once witnessed so marvellous a spectacle as that presented by the Arabs in the ninth century. This pastoral people, whose fanaticism had suddenly made them masters of half of the world, having once founded their empire, immediately set themselves to acquire that knowledge of the sciences which alone was lacking to their greatness. Of all the invaders who competed for the last remains of the Roman Empire they alone pursued such studies; while the Germanic hordes, glorying in their brutality and ignorance, took a thousand years to re-unite the broken chain of tradition, the Arabs accomplished this in less than a century. They provoked the competition of the conquered Christians— a healthy competition which secured the harmony of the races.

"At the end of the eighth century, their whole scientific possessions consisted of a translation of one medical treatise and some books on alchemy. Before the ninth century had run to its close, the Arabs were in possession of all the science of the Greeks; they had produced from their own ranks students of the first order, and had raised among their initiators men who, without them, would have been groping in the dark; and they showed from this time an aptitude for the exact sciences, which was lacking in their instructors, whom they henceforward surpassed."

It was chiefly through the Nestorians that the Arabs became acquainted with Greek medicine, and there were two famous families of translators, the Bakhtishuas and the Mesues, both Syrians, and probably not very thoroughly versed in either Greek or Arabic. But the prince of translators, one of the finest figures of the century, was Honein, a Christian Arab, born in 809, whose name was Latinized as Joannitius. "The marvellous extent of his works, their excellence, their importance, the trials he bore nobly at the beginning of his career, everything about him arouses our interest and sympathy. If he did not actually create the Oriental renaissance movement, certainly no one played in it a more active, decided and fruitful part." His industry was colossal. He translated most of the works of Hippocrates and Galen, Aristotle and many others. His famous "Introduction" or "Isagoge," a very popular book in the Middle Ages, is a translation of the "Microtegni" of Galen, a small hand-book, of which a translation is appended to Cholmeley's "John of Gaddesden." The first printed edition of it appeared in 1475 (see Chapter IV) at Padua.

Leclerc gives the names of more than one hundred known translators who not only dealt with the physicians but with the Greek philosophers, mathematicians and astronomers. The writings of the physicians of India and of Persia were also translated into Arabic.

But close upon the crowd of translators who introduced the learning of Greece to the Arabians came original observers of the first rank, to a few only of whom time will allow me to refer. Rhazes, so called from the name of the town (Rai) in which he was born, was educated at the great hospital at Bagdad in the second half of the ninth century. With a true Hippocratic spirit he made many careful observations on disease, and to him we owe the first accurate account of smallpox, which he differentiated from measles. This work was translated for the old Sydenham Society by W.A. Greenhill (1848), and the description given of the disease is well worth reading. He was a man of strong powers of observation, good sense and excellent judgment. His works were very popular, particularly the gigantic "Continens," one of the bulkiest of incunabula. The Brescia edition, 1486, a magnificent volume, extends over 588 pages and it must weigh more than seventeen pounds. It is an encyclopaedia filled with extracts from the Greek and other writers, interspersed with memoranda of his own experiences. His "Almansor" was a very popular text-book, and one of the first to be printed. Book IX of "Almansor" (the name of the prince to whom it was addressed) with the title "De aegritudinibus a capite usque ad pedes," was a very favorite mediaeval text-book. On account of his zeal for study Rhazes was known as the "Experimentator."

The first of the Arabians, known throughout the Middle Ages as the Prince, the rival, indeed, of Galen, was the Persian Ibn Sina, better known as Avicenna, one of the greatest names in the history of medicine. Born about 980 A. D. in the province of Khorasan, near Bokhara, he has left a brief autobiography from which we learn something of his early years. He could repeat the Koran by heart when ten years old, and at twelve he had disputed in law and in logic. So that he found medicine was an easy subject, not hard and thorny like mathematics and metaphysics! He worked night and day, and could solve problems in his dreams. "When I found a difficulty," he says, "I referred to my notes and prayed to the Creator. At night, when weak or sleepy, I strengthened myself with a glass of wine." He was a voluminous writer to whom scores of books are attributed, and he is the author of the most famous medical text-book ever written. It is safe to say that the "Canon" was a medical bible for a longer period than any other work. It "stands for the epitome of all precedent development, the final codification of all Graeco-Arabic medicine. It is a hierarchy of laws liberally illustrated by facts which so ingeniously rule and are subject to one another, stay and uphold one another, that admiration is compelled for the sagacity of the great organiser who, with unparalleled power of systematisation, collecting his material from all sources, constructed so imposing an edifice of fallacy. Avicenna, according to his lights, imparted to contemporary medical science the appearance of almost mathematical accuracy, whilst the art of therapeutics, although empiricism did not wholly lack recognition, was deduced as a logical sequence from theoretical (Galenic and Aristotelian) premises. Is it, therefore, matter for surprise that the majority of investigators and practitioners should have fallen under the spell of this consummation of formalism and should have regarded the Canon' as an infallible oracle, the more so in that the logical construction was impeccable and the premises, in the light of contemporary conceptions, passed for incontrovertible axioms?"

Innumerable manuscripts of it exist: of one of the most beautiful, a Hebrew version (Bologna Library), I give an illustration. A Latin version was printed in 1472 and there are many later editions, the last in 1663. Avicenna was not only a successful writer, but the prototype of the successful physician who was at the same time statesman, teacher, philosopher and literary man. Rumor has it that he became dissipated, and a contemporary saying was that all his philosophy could not make him moral, nor all his physic teach him to preserve his health. He enjoyed a great reputation as a poet. I reproduce a page of a manuscript of one of his poems, which we have in the Bodleian Library. Prof. A.V.W. Jackson says that some of his verse is peculiarly Khayyamesque, though he antedated Omar by a century. That "large Infidel" might well have written such a stanza as

> From Earth's dark centre unto Saturn's Gate
> I've solved all problems of this world's Estate,
> From every snare of Plot and Guile set free,
> Each bond resolved, saving alone Death's Fate.

His hymn to the Deity might have been written by Plato and rivals the famous one of Cleanthes. A casual reader gets a very favorable impression of Avicenna. The story of his dominion over the schools in the Middle Ages is one of the most striking in our history. Perhaps we feel that Leclerc exaggerates when he says: "Avicenna is an intellectual phenomenon. Never perhaps has an example been seen of so precocious, quick and wide an intellect extending and asserting itself with so strange and indefatigable an activity." The touch of the man never reached me until I read some of his mystical and philosophical writings translated by Mehren. It is Plato over again. The beautiful allegory in which men are likened to birds snared and caged until set free by the Angel of Death might be met with anywhere in the immortal Dialogues. The tractate on Love is a commentary on the Symposium; and the essay on Destiny is Greek in spirit without a trace of Oriental fatalism, as you may judge from the concluding sentence, which I leave you as his special message: "Take heed to the limits of your capacity and you will arrive at a knowledge of the truth! How true is the saying:—Work ever and to each will come that measure of success for which Nature has designed him." Avicenna died in his fifty-eighth year. When he saw that physic was of no avail, resigning himself to the inevitable, he sold his goods, distributed the money to the poor, read the Koran through once every three days, and died in the holy month of Ramadan. His tomb at Hamadan, the ancient Ecbatana, still exists, a simple brickwork building, rectangular in shape, and surrounded by an unpretentious court. It was restored in 1877, but is again in need of repair. The illustration here shown is from a photograph sent by Dr. Neligan of Teheran. Though dead, the great Persian has still a large practice, as his tomb is much visited by pilgrims, among whom cures are said to be not uncommon.

The Western Caliphate produced physicians and philosophers almost as brilliant as those of the East. Remarkable schools of medicine were founded at Seville, Toledo and Cordova. The most famous of the professors were Averroes, Albucasis and Avenzoar. Albucasis was "the Arabian restorer of surgery." Averroes, called in the Middle Ages "the Soul of Aristotle" or "the Commentator," is better known today among philosophers than physicians. On the revival of Moslem orthodoxy he fell upon evil days, was persecuted as a free-thinker, and the saying is attributed to him—"Sit anima mea cum philosophic."

Arabian medicine had certain very definite characteristics: the basis was Greek, derived from translations of the works of Hippocrates and Galen. No contributions were made to anatomy, as dissections were prohibited, nor to physiology, and the pathology was practically that of Galen. Certain new and important diseases were described; a number of new and active remedies were introduced, chiefly from the vegetable kingdom. The Arabian hospitals were well organized and were deservedly famous. No such hospital exists today in Cairo as that which was built by al-Mansur Gilafun in 1283. The description of it by Makrizi, quoted by Neuburger, reads like that of a twentieth century institution with hospital units.

"I have founded this institution for my equals and for those beneath me, it is intended for rulers and subjects, for soldiers and for the emir, for great and small, freemen and slaves, men and women." "He ordered medicaments, physicians and everything else

that could be required by anyone in any form of sickness; placed male and female attendants at the disposal of the patients, determined their pay, provided beds for patients and supplied them with every kind of covering that could be required in any complaint. Every class of patient was accorded separate accommodation: the four halls of the hospital were set apart for those with fever and similar complaints; one part of the building was reserved for eye-patients, one for the wounded, one for those suffering from diarrhoea, one for women; a room for convalescents was divided into two parts, one for men and one for women. Water was laid on to all these departments. One room was set apart for cooking food, preparing medicine and cooking syrups, another for the compounding of confections, balsams, eye-salves, etc. The head-physician had an apartment to himself wherein he delivered medical lectures. The number of patients was unlimited, every sick or poor person who came found admittance, nor was the duration of his stay restricted, and even those who were sick at home were supplied with every necessity."— Makrizi.

"In later times this hospital was much extended and improved. The nursing was admirable and no stint was made of drugs and appliances; each patient was provided with means upon leaving so that he should not require immediately to undertake heavy work." Neuburger: History of Medicine, Vol. 1, p. 378.

It was in the domain of chemistry that the Arabs made the greatest advances. You may remember that, in Egypt, chemistry had already made considerable strides, and I alluded to Prof. Elliot Smith's view that one of the great leaps in civilization was the discovery in the Nile Valley of the metallurgy of copper. In the brilliant period of the Ptolemies, both chemistry and pharmacology were studied, and it seems not improbable that, when the Arabs took Alexandria in the year 640, there were still many workers in these subjects.

The most famous of those early Arabic writers is the somewhat mythical Geber, who lived in the first half of the eighth century, and whose writings had an extraordinary influence throughout the Middle Ages. The whole story of Geber is discussed by Berthelot in his "La chimie au moyen age" (Paris, 1896). The transmission of Arabian science to the Occident began with the Crusades, though earlier a filtering of important knowledge in mathematics and astronomy had reached Southern and Middle Europe through Spain. Among the translators several names stand out prominently. Gerbert, who became later Pope Sylvester II, is said to have given us our present Arabic figures. You may read the story of his remarkable life in Taylor, who says he was "the first mind of his time, its greatest teacher, its most eager learner, and most universal scholar." But he does not seem to have done much directly for medicine.

The Graeco-Arabic learning passed into Europe through two sources. As I have already mentioned, Constantinus Africanus, a North African Christian monk, widely travelled and learned in languages, came to Salernum and translated many works from Arabic into Latin, particularly those of Hippocrates and Galen. The "Pantegni" of the latter became one of the most popular text-books of the Middle Ages. A long list of other works which he translated is given by Steinschneider. It is not unlikely that Arabic

medicine had already found its way to Salernum before the time of Constantine, but the influence of his translations upon the later Middle Ages was very great.

The second was a more important source through the Latin translators in Spain, particularly in Toledo, where, from the middle of the twelfth till the middle of the thirteenth century, an extraordinary number of Arabic works in philosophy, mathematics and astronomy were translated. Among the translators, Gerard of Cremona is prominent, and has been called the "Father of Translators." He was one of the brightest intelligences of the Middle Ages, and did a work of the first importance to science, through the extraordinary variety of material he put in circulation. Translations, not only of the medical writers, but of an indiscriminate crowd of authors in philosophy and general literature, came from his pen. He furnished one of the first translations of the famous "Almagest" of Ptolemy, which opened the eyes of his contemporaries to the value of the Alexandrian astronomy. Leclerc gives a list of seventy-one works from his hand.

Many of the translators of the period were Jews, and many of the works were translated from Hebrew into Latin. For years Arabic had been the learned language of the Jews, and in a large measure it was through them that the Arabic knowledge and the translations passed into South and Central Europe.

The Arab writer whose influence on mediaeval thought was the most profound was Averroes, the great commentator on Aristotle.

THE RISE OF THE UNIVERSITIES

THE most striking intellectual phenomenon of the thirteenth century is the rise of the universities. The story of their foundation is fully stated in Rashdall's great work (Universities of Europe in the Middle Ages, Oxford, 1895). Monastic and collegiate schools, seats of learning like Salernum, student guilds as at Bologna, had tried to meet the educational needs of the age. The word "university" literally means an association, and was not at first restricted to learned bodies. The origin appears to have been in certain guilds of students formed for mutual protection associated at some place specially favorable for study—the attraction generally being a famous teacher. The University of Bologna grew up about guilds formed by students of law, and at Paris, early in the twelfth century, there were communities of teachers, chiefly in philosophy and theology. In this way arose two different types of mediaeval university. The universities of Northern Italy were largely controlled by students, who were grouped in different "nations." They arranged the lectures and had control of the appointment of teachers. On the other hand, in the universities founded on the Paris model the masters had control of the studies, though the students, also in nations, managed their own affairs.

Two universities have a special interest at this period in connection with the development of medical studies, Bologna and Montpellier. At the former the study of anatomy was revived. In the knowledge of the structure of the human body no advance had been made for more than a thousand years—since Galen's day. In the process of translation from Greek to Syriac, from Syriac to Arabic, from Arabic to Hebrew, and

from Hebrew or Arabic to Latin, both the form and thought of the old Greek writers were not infrequently confused and often even perverted, and Galen's anatomy had suffered severely in the transmission. Our earliest knowledge of the teaching of medicine at Bologna is connected with a contemporary of Dante, Taddeo Alderotti, who combined Arabian erudition with the Greek spirit. He occupied a position of extraordinary prominence, was regarded as the first citizen of Bologna and a public benefactor exempt from the payment of taxes. That he should have acquired wealth is not surprising if his usual fees were at the rate at which he charged Pope Honorius IV, i.e., two hundred florins a day, besides a "gratification" of six thousand florins.

The man who most powerfully influenced the study of medicine in Bologna was Mundinus, the first modern student of anatomy. We have seen that at the school of Salernum it was decreed that the human body should be dissected at least once every five years, but it was with the greatest difficulty that permission was obtained for this purpose. It seems probable that under the strong influence of Taddeo there was an occasional dissection at Bologna, but it was not until Mundinus (professor from 1306 to 1326) took the chair that the study of anatomy became popular. The bodies were usually those of condemned criminals, but in the year 1319 there is a record of a legal procedure against four medical students for body-snatching—the first record, as far as I know, of this gruesome practice. In 1316, Mundinus issued his work on anatomy, which served as a text-book for more than two hundred years. He quotes from Galen the amusing reasons why a man should write a book: "Firstly, to satisfy his own friends; secondly, to exercise his best mental powers; and thirdly, to be saved from the oblivion incident to old age." Scores of manuscripts of his work must have existed, but they are now excessively rare in Italy. The book was first printed at Pavia in 1478, in a small folio without figures. It was very often reprinted in the fifteenth and sixteenth centuries. The quaint illustration shows us the mediaeval method of teaching anatomy: the lecturer sitting on a chair reading from Galen, while a barber surgeon, or an "Ostensor," opens the cavities of the body.

I have already referred to the study of medicine by women at Salernum. Their names are also early met with in the school of Bologna. Mundinus is said to have had a valuable assistant, a young girl, Alessandra Giliani, an enthusiastic dissector, who was the first to practice the injection of the blood vessels with colored liquids. She died, consumed by her labors, at the early age of nineteen, and her monument is still to be seen.

Bologna honored its distinguished professors with magnificent tombs, sixteen or seventeen of which, in a wonderful state of preservation, may still be seen in the Civic Museum. That of Mundinus also exists a sepulchral bas-relief on the wall of the Church of San Vitale at Bologna.

The other early mediaeval university of special interest in medicine is that of Montpellier. With it are connected three teachers who have left great names in our story— Arnold of Villanova, Henri de Mondeville and Guy de Chauliac. The city was very favorably situated not far from the Spanish border, and the receding tide of the Arab invasion in the eighth century had left a strong Arabic influence in that province.

The date of the origin of the university is uncertain, but there were teachers of medicine there in the twelfth century, though it was not until 1289 that it was formally founded by a papal bull.

Arnold of Villanova was one of the most prolific writers of the Middle Ages. He had travelled much, was deeply read in Arabic medicine and was also a student of law and of philosophy. He was an early editor of the Regimen Sanitatis, and a strong advocate of diet and hygiene. His views on disease were largely those of the Arabian physicians, and we cannot see that he himself made any very important contribution to our knowledge; but he was a man of strong individuality and left an enduring mark on mediaeval medicine, as one may judge from the fact that among the first hundred medical books printed there were many associated with his name. He was constantly in trouble with the Church, though befriended by the Popes on account of his medical knowledge. There is a Bull of Clement V asking the bishops to search for a medical book by Arnold dedicated to himself, but not many years later his writings were condemned as heretical.

In Henri de Mondeville we have the typical mediaeval surgeon, and we know his work now very thoroughly from the editions of his "Anatomy" and "Surgery" edited by Pagel (Berlin, 1889-1892), and the fine French edition by Nicaise (Paris, 1893). The dominant Arabic influence is seen in that he quotes so large a proportion of these authors, but he was an independent observer and a practical surgeon of the first rank. He had a sharp wit and employed a bitter tongue against the medical abuses of his day. How the Hippocratic humors dominated practice at this time you may see at a glance from the table prepared by Nicaise from the works of de Mondeville. We have here the whole pathology of the period.

TABLEAU DES HUMEURS D'APRES H. DE MONDEVILLE

Flegme naturel.
F. aqueux.
Flegme F. mucilagineux.
F. vitreux.
Flegme non naturel F sale.
F. doux.
F. pontique, 2 especes.
F. acide, 2 especes.
Bile naturelle.
Bile B. citrine.
B. vitelline
Bile non naturelle B. praline.
B. aerugineuse.
B. brulee, 3 especes.
Sang naturel.

non naturel, 5 especes.
Melancolie naturelle.
non naturelle, 5 especes.

A still greater name in the history of this school is Guy de Chauliac, whose works have also been edited by Nicaise (Paris, 1890). His "Surgery" was one of the most important text-books of the late Middle Ages. There are many manuscripts of it, some fourteen editions in the fifteenth century and thirty-eight in the sixteenth, and it continued to be reprinted far into the seventeenth century. He too was dominated by the surgery of the Arabs, and on nearly every page one reads of the sages Avicenna, Albucasis or Rhazes. He lays down four conditions necessary for the making of a surgeon—the first is that he must be learned, the second, expert, the third that he should be clever, and the fourth that he should be well disciplined.

You will find a very discerning sketch of the relation of these two men to the history of surgery in the address given at the St. Louis Congress in 1904 by Sir Clifford Allbutt. They were strong men with practical minds and good hands, whose experience taught them wisdom. In both there was the blunt honesty that so often characterizes a good surgeon, and I commend to modern surgeons de Mondeville's saying: "If you have operated conscientiously on the rich for a proper fee, and on the poor for charity, you need not play the monk, nor make pilgrimages for your soul."

One other great mediaeval physician may be mentioned, Peter of Abano (a small town near Padua, famous for its baths). He is the first in a long line of distinguished physicians connected with the great school of Padua. Known as "the Conciliator," from his attempt to reconcile the diverse views on philosophy and medicine, he had an extraordinary reputation as a practitioner and author, the persistence of which is well illustrated by the fact that eight of the one hundred and eighty-two medical books printed before 1481 were from his pen. He seems to have taught medicine in Paris, Bologna and Padua. He was a devoted astrologer, had a reputation among the people as a magician and, like his contemporary, Arnold of Villanova, came into conflict with the Church and appears to have been several times before the Inquisition; indeed it is said that he escaped the stake only by a timely death. He was a prolific commentator on Aristotle, and his exposition of the "problems" had a great vogue. The early editions of his texts are among the most superb works ever printed. He outlived his reputation as a magician, and more than a century after his death Frederick, Duke of Urbino, caused his effigies to be set up over the gate of the palace at Padua with this inscription:

PETRUS APONUS PATAVINUS PHILOSOPHIAE MEDICINAEQUE SCIENTISSIMUS, OB IDQUE, CONCILIATORIS NOMEN ADEPTUS, ASTROLOGIAE VERO ADEO PERITUS, UT IN MAGIAE SUSPICIONEM INCIDERIT, FALSOQUE DE HAERESI POSTULATUS, ABSOLUTUS FUERIT.

It is said that Abano caused to be painted the astronomical figures in the great hall of the palace at Padua.

One characteristic of mediaeval medicine is its union with theology, which is not remarkable, as the learning of the time was chiefly in the hands of the clergy. One of the most popular works, the "Thesaurus Pauperum," was written by Petrus Hispanus, afterwards Pope John XXI. We may judge of the pontifical practice from the page here reproduced, which probably includes, under the term "iliac passion," all varieties of appendicitis.

For our purpose two beacons illuminate the spirit of the thirteenth century in its outlook on man and nature. Better than Abelard or St. Thomas Aquinas, and much better than any physicians, Albertus Magnus and Roger Bacon represent the men who were awake to greet the rising of the sun of science. What a contrast in their lives and in their works! The great Dominican's long life was an uninterrupted triumph of fruitful accomplishment the titanic task he set himself was not only completed but was appreciated to the full by his own generation—al life not only of study and teaching, but of practical piety. As head of the order in Germany and Bishop of Regensburg, he had wide ecclesiastical influence; and in death he left a memory equalled only by one or two of his century, and excelled only by his great pupil, Thomas Aquinas. There are many Alberts in history the Good, the Just, the Faithful but there is only one we call "Magnus" and he richly deserved the name. What is his record? Why do we hold his name in reverence today?

Albertus Magnus was an encyclopaedic student and author, who took all knowledge for his province. His great work and his great ambition was to interpret Aristotle to his generation. Before his day, the Stagirite was known only in part, but he put within the reach of his contemporaries the whole science of Aristotle, and imbibed no small part of his spirit. He recognized the importance of the study of nature, even of testing it by way of experiment, and in the long years that had elapsed since Theophrastus no one else, except Dioscorides, had made so thorough a study of botany. His paraphrases of the natural history books of Aristotle were immensely popular, and served as a basis for all subsequent studies. Some of his medical works had an extraordinary vogue, particularly the "De Secretis Mulierum" and the "De Virtutibus Herbarum," but there is some doubt as to the authorship of the first named, although Jammy and Borgnet include it in the collected editions of his works. So fabulous was his learning that he was suspected of magic and comes in Naude's list of the wise men who have unjustly been reputed magicians. Ferguson tells that "there is in actual circulation at the present time a chapbook . . . containing charms, receipts, sympathetical and magicalcures for man and animals, . . . which passes under the name of Albertus." But perhaps the greatest claim of Albertus to immortality is that he was the teacher and inspirer of Thomas Aquinas, the man who undertook the colossal task of fusing Aristotelian philosophy with Christian theology, and with such success that the "angelic doctor" remains today the supreme human authority of the Roman Catholic Church.

A man of much greater interest to us from the medical point of view is Roger Bacon and for two reasons. More than any other mediaeval mind he saw the need of the study of nature by a new method. The man who could write such a sentence as this: "Experimental science has three great prerogatives over other sciences; it verifies conclusions by direct experiment; it discovers truth which they never otherwise would reach; it investigates the course of nature and opens to us a knowledge of the past and of the future," is mentally of our day and generation. Bacon was born out of due time, and his contemporaries had little sympathy with his philosophy, and still less with his mechanical schemes and inventions. From the days of the Greeks, no one had had so keen an appreciation of what experiment meant in the development of human knowledge, and he was obsessed with the idea, so commonplace to us, that knowledge should have its utility and its practical bearing. "His chief merit is that he was one of the first to point the way to original research—as opposed to the acceptance of an authority—though he himself still lacked the means of pursuing this path consistently. His inability to satisfy this impulse led to a sort of longing, which is expressed in the numerous passages in his works where he anticipates man's greater mastery over nature."

Bacon wrote a number of medical treatises, most of which remain in manuscript. His treatise on the "Cure of Old Age and the Preservation of Youth" was printed in English in 1683. His authorities were largely Arabian. One of his manuscripts is "On the Bad Practices of Physicians." On June 10, 1914, the eve of his birth, the septencentenary of Roger Bacon will be celebrated by Oxford, the university of which he is the most distinguished ornament. His unpublished MSS. in the Bodleian will be issued by the Clarendon Press (1915-1920), and it is hoped that his unpublished medical writings will be included.

It may be interesting to note the three causes to which Bacon attributes old age: "As the World waxeth old, Men grow old with it: not by reason of the Age of the World, but because of the great Increase of living Creatures, which infect the very Air, that every way encompasseth us, and Through our Negligence in ordering our Lives, and That great Ignorance of the Properties which are in things conducing to Health, which might help a disordered way of Living, and might supply the defect of due Government."

What would have been its fate if the mind of Europe had been ready for Roger Bacon's ferment, and if men had turned to the profitable studies of physics, astronomy and chemistry instead of wasting centuries over the scholastic philosophy and the subtleties of Duns Scotus, Abelard and Thomas Aquinas? Who can say? Make no mistake about the quality of these meniants in intellect, who have had their place in the evolution of the race; but from the standpoint of man struggling for the mastery of this world they are like the members of Swift's famous college "busy distilling sunshine from cucumbers." I speak, of course, from the position of the natural man, who sees for his fellows more hope from the experiments of Roger Bacon than from the disputations of philosophy on the "Instants, Familiarities, Quiddities and Relations," which so roused the scorn of Erasmus.

MEDIAEVAL MEDICAL STUDIES

IT will be of interest to know what studies were followed at a mediaeval university. At Oxford, as at most of the continental universities, there were three degrees, those of Bachelor, Licentiate and Doctor. The books read were the "Tegni" of Galen, the "Aphorisms" of Hippocrates, the "De Febribus" of Isaac and the "Antidotarium" of Nicolaus Salernitanus: if a graduate in arts, six years' study in all was required, in other faculties, eight. One gets very full information on such matters from a most interesting book, "Une Chaire de Medecine au XVe Siecle," by Dr. Ferrari (Paris, 1899). The University of Pavia was founded in 1361, and like most of those in Italy was largely frequented by foreigners, who were arranged, as usual, according to their nationalities; but the students do not appear to have controlled the university quite so much as at Bologna. The documents of the Ferrari family, on which the work is based, tell the story of one of its members, who was professor at Pavia from 1432 to 1472. One is surprised at the range of studies in certain directions, and still more at the absence of other subjects. A list is given of the teachers in medicine for the year 1433, twenty in all, and there were special lectures for the morning, afternoon and evening. The subjects are medicine, practical medicine, physics, metaphysics, logic, astrology, surgery and rhetoric: very striking is the omission of anatomy, which does not appear in the list even in 1467. The salaries paid were not large, so that most of the teachers must have been in practice: four hundred and five hundred florins was the maximum.

The dominance of the Arabians is striking. In 1467, special lectures were given on the "Almansor" of Rhazes, and in the catalogue of the Ferrari's library more than one half of the books are Arabian commentaries on Greek medicine. Still more striking evidence of their influence is found in the text-book of Ferrari, which was printed in 1471 and had been circulated earlier in MS. In it Avicenna is quoted more than 3000 times, Rhazes and Galen 1000, Hippocrates only 140 times. Professor Ferrari was a man who played an important role in the university, and had a large consultation practice. You will be interested to know what sort of advice he gave in special cases. I have the record of an elaborate consultation written in his own hand, from which one may gather what a formidable thing it was to fall into the hands of a mediaeval physician. Signor John de Calabria had a digestive weakness of the stomach, and rheumatic cerebral disease, combined with superfluous heat and dryness of the liver and multiplication of choler. There is first an elaborate discussion on diet and general mode of life; then he proceeds to draw up certain light medicines as a supplement, but it must have taken an extensive apothecary's shop to turn out the twenty-two prescriptions designed to meet every possible contingency.

One of the difficulties in the early days of the universities was to procure good MSS. In the Paris Faculty, the records of which are the most complete in Europe, there is an inventory for the year 1395 which gives a list of twelve volumes, nearly all by Arabian authors. Franklin gives an interesting incident illustrating the rarity of medical MSS.

at this period. Louis XI, always worried about his health, was anxious to have in his library the works of Rhazes. The only copy available was in the library of the medical school. The manuscript was lent, but on excellent security, and it is nice to know that it was returned.

It is said that one of the special advantages that Montpellier had over Paris was its possession of so many important MSS., particularly those of the Arabian writers. Many "Compendia" were written containing extracts from various writers, and no doubt these were extensively copied and lent or sold to students. At Bologna and Padua, there were regulations as to the price of these MSS. The university controlled the production of them, and stationers were liable to fines for inaccurate copies. The trade must have been extensive in those early days, as Rashdall mentions that in 1323 there were twenty-eight sworn booksellers in Paris, besides keepers of bookstalls in the open air.

MEDIAEVAL PRACTICE

THE Greek doctrine of the four humors colored all the conceptions of disease; upon their harmony alone it was thought that health depended. The four temperaments, sanguine, phlegmatic, bilious and melancholic, corresponded with the prevalence of these humors. The body was composed of certain so-called "naturals," seven in number—the elements, the temperaments, the humors, the members or parts, the virtues or faculties, the operations or functions and the spirits. Certain "non-naturals," nine in number, preserved the health of the body, viz. air, food and drink, movement and repose, sleeping and waking, excretion and retention, and the passions. Disease was due usually to alterations in the composition of the humors, and the indications for treatment were in accordance with these doctrines. They were to be evacuated, tenuated, cooled, heated, purged or strengthened. This humoral doctrine prevailed throughout the Middle Ages, and reached far into modern times indeed, echoes of it are still to be heard in popular conversations on the nature of disease.

The Arabians were famous for their vigor and resource in matters of treatment. Bleeding was the first resort in a large majority of all diseases. In the "Practice" of Ferrari there is scarcely a malady for which it is not recommended. All remedies were directed to the regulation of the six non-naturals, and they either preserved health, cured the disease or did the opposite. The most popular medicines were derived from the vegetable kingdom, and as they were chiefly those recommended by Galen, they were, and still are, called by his name. Many important mineral medicines were introduced by the Arabians, particularly mercury, antimony, iron, etc. There were in addition scores of substances, the parts or products of animals, some harmless, others salutary, others again useless and disgusting. Minor surgery was in the hands of the barbers, who performed all the minor operations, such as bleeding; the more important operations, few in number, were performed by surgeons.

ASTROLOGY AND DIVINATION

AT this period astrology, which included astronomy, was everywhere taught. In the "Gouernaunce of Prynces, or Pryvete of Pryveties," translated by James Yonge, 1422, there occurs the statement: "As Galian the lull wies leche Saith and Isoder the Gode clerk, hit witnessith that a man may not perfitely can the sciens and craft of Medissin but yef he be an astronomoure."

We have seen how the practice of astrology spread from Babylonia and Greece throughout the Roman Empire. It was carried on into the Middle Ages as an active and aggressive cult, looked upon askance at times by the Church, but countenanced by the courts, encouraged at the universities, and always by the public. In the curriculum of the mediaeval university, astronomy made up with music, arithmetic and geometry the Quadrivium. In the early faculties, astronomy and astrology were not separate, and at Bologna, in the early fourteenth century, we meet with a professorship of astrology.(27) One of the duties of this salaried professor, was to supply "judgements" gratis for the benefit of enquiring students, a treacherous and delicate assignment, as that most distinguished occupant of the chair at Bologna, Cecco d'Ascoli, found when he was burned at the stake in 1357, a victim of the Florentine Inquisition.

Roger Bacon himself was a warm believer in judicial astrology and in the influence of the planets, stars and comets on generation, disease and death.

Many of the stronger minds of the Renaissance broke away from the follies of the subject. Thus Cornelius Agrippa in reply to the request of a friar to consult the stars on his behalf says: "Judicial astrology is nothing more than the fallacious guess of superstitious men, who have founded a science on uncertain things and are deceived by it: so think nearly all the wise; as such it is ridiculed by some most noble philosophers; Christian theologians reject it, and it is condemned by sacred councils of the Church. Yet you, whose office it is to dissuade others from these vanities, oppressed, or rather blinded by I know not what distress of mind, flee to this as to a sacred augur, and as if there were no God in Israel, that you send to inquire of the god of Ekron."

In spite of the opposition of the Church astrology held its own; many of the universities at the end of the fifteenth century published almanacs, usually known as "Prognosticons," and the practice was continued far into the sixteenth century. I show you here an illustration. Rabelais, you may remember, when physician to the Hotel Dieu in Lyons, published almanacs for the years 1533, 1535, 1541, 1546. In the title-page he called himself "Doctor of Medicine and Professor of Astrology," and they continued to be printed under his name until 1556. In the preparation of these he must have had his tongue in his cheek, as in his famous "Pantagrueline Prognostication," in which, to satisfy the curiosity of all good companions, he had turned over all the archives of the heavens, calculated the quadratures of the moon, hooked out all that has ever been thought by all the Astrophils, Hypernephilists, Anemophylakes, Uranopets and Ombrophori, and felt on every point with Empedocles.

Even physicians of the most distinguished reputation practised judicial astrology. Jerome Cardan was not above earning money by casting horoscopes, and on this subject he wrote one of his most popular books (De Supplemento Almanach, etc., 1543), in which astronomy and astrology are mixed in the truly mediaeval fashion. He gives in it some sixty-seven nativities, remarkable for the events they foretell, with an exposition. One of the accusations brought against him was that he had "attempted to subject to the stars the Lord of the stars and cast our Saviour's horoscope." Cardan professed to have abandoned a practice looked upon with disfavor both by the Church and by the universities, but he returned to it again and again. I show here his own horoscope. That remarkable character, Michael Servetus, the discoverer of the lesser circulation, when a fellow student with Vesalius at Paris, gave lectures upon judicial astrology, which brought him into conflict with the faculty; and the rarest of the Servetus works, rarer even than the "Christianismi Restitutio," is the "Apologetica disceptatio pro astrologia," one copy of which is in the Bibliotheque Nationale. Nor could the new astronomy and the acceptance of the heliocentric views dislocate the popular belief. The literature of the seventeenth century is rich in astrological treatises dealing with medicine.

No one has ever poured such satire upon the mantic arts as did Rabelais in chapter twenty-five of the third book of "Pantagruel." Panurge goes to consult Her Trippa the famous Cornelius Agrippa, whose opinion of astrology has already been quoted, but who nevertheless, as court astrologer to Louise of Savoy, had a great contemporary reputation. After looking Panurge in the face and making conclusions by metoposcopy and physiognomy, he casts his horoscope secundum artem, then, taking a branch of tamarisk, a favorite tree from which to get the divining rod, he names some twenty-nine or thirty mantic arts, from pyromancy to necromancy, by which he offers to predict his future. While full of rare humor, this chapter throws an interesting light on the extraordinary number of modes of divination that have been employed. Small wonder that Panurge repented of his visit! I show here the title-page of a popular book by one of the most famous of the English astrological physicians, Nicholas Culpeper.

Never was the opinion of sensible men on this subject better expressed than by Sir Thomas Browne: "Nor do we hereby reject or condemn a sober and regulated Astrology; we hold there is more truth therein than in ASTROLOGERS; in some more than many allow, yet in none so much as some pretend. We deny not the influence of the Starres, but often suspect the due application thereof; for though we should affirm that all things were in all things; that Heaven were but Earth Celestified, and earth but Heaven terrestrified, or that each part above had an influence upon its divided affinity below; yet how to single out these relations, and duly to apply their actions, is a work ofttimes to be effected by some revelation, and Cabala from above, rather than any Philosophy, or speculation here below."

As late as 1699, a thesis was discussed at the Paris Faculty, "Whether comets were harbingers of disease," and in 1707 the Faculty negatived the question propounded in a thesis, "Whether the moon had any sway on the human body."

The eighteenth and nineteenth centuries saw, among intelligent men, a progressive weakening of the belief in the subject; but not even the satire of Swift, with his practical joke in predicting and announcing the death of the famous almanac maker, nor contemptuous neglect of the subject of late years sufficed to dispel the belief from the minds of the public. Garth in the Dispensary (1699) satirizes the astrological practitioners of his day:

> The Sage in Velvet Chair, here lolls at Ease
> To promise future Health for present Fees
> Then as from Tripod solemn Sham reveals
> And what the Stars know nothing of foretell. (Canto ii.)

The almanacs of Moore and Zadkiel continue to be published, and remain popular. In London, sandwich men are to be met with carrying advertisements of Chaldeans and Egyptians who offer to tell your fortune by the stars. Even in this country, astrology is still practiced to a surprising extent if one may judge from advertisements in certain papers, and from publications which must have a considerable sale. Many years ago, I had as a patient an estimable astrologer, whose lucrative income was derived from giving people astral information as to the rise and fall of stocks. It is a chapter in the vagaries of the human mind that is worth careful study. Let me commend to your reading the sympathetic story called "A Doctor of Medicine" in the "Rewards and Fairies" of Kipling. The hero is Nicholas Culpeper, Gent., whose picture is here given. One stanza of the poem at the end of the story, "Our Fathers of Old," may be quoted:

> Wonderful tales had our fathers of old—
> Wonderful tales of the herbs and the stars—
> The Sun was Lord of the Marigold,
> Basil and Rocket belonged to Mars.
> Pat as a sum in division it goes
> (Every plant had a star bespoke)
> Who but Venus should govern the Rose?
> Who but Jupiter own the Oak?
> Simply and gravely the facts are told
> In the wonderful books of our fathers of old.

Editor's note: It is not generally known that Stonewall Jackson practiced astrology. Col. J. W. Revere in "Keel and Saddle" (Boston, 1872) tells of meeting Jackson in 1852 on a Mississippi steamer and talking with him on the subject. Some months later, Revere received a letter from Jackson enclosing his (Revere's) horoscope. There was a "culmination of the malign aspect during the first days of May, 1863—both will be exposed to a common

danger at the time indicated." At the battle of Chancellorsville, May 9, 1863, Revere saw Jackson mortally wounded!

James J. Walsh of New York has written a book of extraordinary interest called "The Thirteenth, Greatest of Centuries." I have not the necessary knowledge to say whether he has made out his case or not for art and for literature. There was certainly a great awakening and, inspired by high ideals, men turned with a true instinct to the belief that there was more in life than could be got out of barren scholastic studies. With many of the strong men of the period one feels the keenest mental sympathy. Grosseteste, the great Clerk of Lincoln, as a scholar, a teacher and a reformer, represents a type of mind that could grow only in fruitful soil. Roger Bacon may be called the first of the moderns certainly the first to appreciate the extraordinary possibilities which lay in a free and untrammelled study of nature. A century which could produce men capable of building the Gothic cathedrals may well be called one of the great epochs in history, and the age that produced Dante is a golden one in literature. Humanity has been the richer for St. Francis; and Abelard, Albertus and Aquinas form a trio not easy to match, in their special departments, either before or after. But in science, and particularly in medicine, and in the advance of an outlook upon nature, the thirteenth century did not help man very much. Roger Bacon was "a voice crying in the wilderness," and not one of the men I have picked out as specially typical of the period instituted any new departure either in practice or in science. They were servile followers, when not of the Greeks, of the Arabians. This is attested by the barrenness of the century and a half that followed. One would have thought that the stimulus given by Mundinus to the study of anatomy would have borne fruit, but little was done in science during the two and a half centuries that followed the delivery of his lectures and still less in the art. While William of Wykeham was building Winchester Cathedral and Chaucer was writing the Canterbury Tales, John of Gaddesden in practice was blindly following blind leaders whose authority no one dared question.

The truth is, from the modern standpoint the thirteenth was not the true dawn brightening more and more unto the perfect day, but a glorious aurora which flickered down again into the arctic night of mediaevalism.

To sum up in medicine the Middle Ages represent a restatement from century to century of the facts and theories of the Greeks modified here and there by Arabian practice. There was, in Francis Bacon's phrase, much iteration, small addition. The schools bowed in humble, slavish submission to Galen and Hippocrates, taking everything from them but their spirit and there was no advance in our knowledge of the structure or function of the body. The Arabians lit a brilliant torch from Grecian lamps and from the eighth to the eleventh centuries the profession reached among them a position of dignity and importance to which it is hard to find a parallel in history.

CHAPTER IV THE RENAISSANCE AND THE RISE OF ANATOMY AND PHYSIOLOGY

THE "reconquest of the classic world of thought was by far the most important achievement of the fifteenth and sixteenth centuries. It absorbed nearly the whole mental energy of the Italians . . . . The revelation of what men were and what they wrought under the influence of other faiths and other impulses, in distant ages with a different ideal for their aim, not only widened the narrow horizon of the Middle Ages, but it also restored self-confidence to the reason of humanity."

Everywhere throughout the Middle Ages learning was the handmaid of theology. Even Roger Bacon with his strong appeal for a new method accepted the dominant mediaeval conviction— that all the sciences did but minister to their queen, Theology. A new spirit entered man's heart as he came to look upon learning as a guide to the conduct of life. A revolution was slowly effected in the intellectual world. It is a mistake to think of the Renaissance as a brief period of sudden fruitfulness in the North Italian cities. So far as science is concerned, the thirteenth century was an aurora followed by a long period of darkness, but the fifteenth was a true dawn that brightened more and more unto the perfect day. Always a reflex of its period, medicine joined heartily though slowly in the revolt against mediaevalism. How slowly I did not appreciate until recently. Studying the earliest printed medical works to catch the point of view of the men who were in the thick of the movement up to 1480 which may be taken to include the first quarter of a century of printing g—one gets a startling record. The mediaeval mind still dominates: of the sixty-seven authors of one hundred and eighty-two editions of early medical books, twenty-three were men of the thirteenth and fourteenth centuries, thirty men of the fifteenth century, eight wrote in Arabic, several were of the School of Salernum, and only six were of classical antiquity, viz., Pliny (first 1469), Hippocrates (1473) (Hain (*)7247), Galen (1475) (Hain 7237), Aristotle (1476), Celsus (1478), and Dioscorides (1478).(**)

The medical profession gradually caught the new spirit. It has been well said that Greece arose from the dead with the New Testament in the one hand and Aristotle in the other. There was awakened a perfect passion for the old Greek writers, and with it a study of the original sources, which had now become available in many manuscripts. Gradually Hippocrates and Galen came to their own again. Almost every professor of medicine became a student of the MSS. of Aristotle and of the Greek physicians, and before 1530 the presses had poured out a stream of editions. A wave of enthusiasm swept over the profession, and the best energies of its best minds were devoted to a study of the Fathers. Galen became the idol of the schools. A strong revulsion of feeling arose against the Arabians, and Avicenna, the Prince, who had been clothed with an authority only a little less than divine, became anathema. Under the leadership of the Montpellier School, the Arabians made a strong fight, but it was a losing battle all along the line. This group of medical humanists—men who were devoted to the study

of the old humanities, as Latin and Greek were called—has had a great and beneficial influence upon the profession. They were for the most part cultivated gentlemen with a triple interest literature, medicine and natural history. How important is the part they played may be gathered from a glance at the "Lives" given by Bayle in his "Biographic Medicale" (Paris, 1855) between the years 1500 and 1575. More than one half of them had translated or edited works of Hippocrates or Galen; many of them had made important contributions to general literature, and a large proportion of them were naturalists: Leonicenus, Linacre, Champier, Fernel, Fracastorius, Gonthier, Caius, J. Sylvius, Brasavola, Fuchsius, Matthiolus, Conrad Gesner, to mention only those I know best, form a great group. Linacre edited Greek works for Aldus, translated works of Galen, taught Greek at Oxford, wrote Latin grammars and founded the Royal College of Physicians.(*) Caius was a keen Greek scholar, an ardent student of natural history, and his name is enshrined as co-founder of one of the most important of the Cambridge colleges. Gonthier, Fernel, Fuchs and Mattioli were great scholars and greater physicians. Champier, one of the most remarkable of the group, was the founder of the Hotel Dieu at Lyons, and author of books of a characteristic Renaissance type and of singular bibliographical interest. In many ways greatest of all was Conrad Gesner, whose mors inopinata at forty-nine, bravely fighting the plague, is so touchingly and tenderly mourned by his friend Caius. Physician, botanist, mineralogist, geologist, chemist, the first great modern bibliographer, he is the very embodiment of the spirit of the age. On the flyleaf of my copy of the "Bibliotheca Universalis" (1545), is written a fine tribute to his memory. I do not know by whom it is, but I do know from my reading that it is true:

> "Conrad Gesner, who kept open house there for all learned men who came into his neighborhood. Gesner was not only the best naturalist among the scholars of his day, but of all men of that century he was the pattern man of letters. He was faultless in private life, assiduous in study, diligent in maintaining correspondence and good-will with learned men in all countries, hospitable though his means were small—to every scholar that came into Zurich. Prompt to serve all, he was an editor of other men's volumes, a writer of prefaces for friends, a suggestor to young writers of books on which they might engage themselves, and a great helper to them in the progress of their work. But still, while finding time for services to other men, he could produce as much out of his own study as though he had no part in the life beyond its walls."

A large majority of these early naturalists and botanists were physicians. The Greek art of observation was revived in a study of the scientific writings of Aristotle, Theophrastus and Dioscorides and in medicine, of Hippocrates and of Galen, all in the Greek originals. That progress was at first slow was due in part to the fact that the leaders were too busy scraping the Arabian tarnish from the pure gold of Greek medicine and correcting the anatomical mistakes of Galen to bother much about his physiology or pathology. Here and there among the great anatomists of the period we read of an

experiment, but it was the art of observation, the art of Hippocrates, not the science of Galen, not the carefully devised experiment to determine function, that characterized their work. There was indeed every reason why men should have been content with the physiology and pathology of that day, as, from a theoretical standpoint, it was excellent. The doctrine of the four humors and of the natural, animal and vital spirits afforded a ready explanation for the symptoms of all diseases, and the practice of the day was admirably adapted to the theories. There was no thought of, no desire for, change. But the revival of learning awakened in men at first a suspicion and at last a conviction that the ancients had left something which could be reached by independent research, and gradually the paralytic-like torpor passed away.

The sixteenth and seventeenth centuries did three things in medicine shattered authority, laid the foundation of an accurate knowledge of the structure of the human body and demonstrated how its functions should be studied intelligently with which advances, as illustrating this period, may be associated the names of Paracelsus, Vesalius and Harvey.

PARACELSUS

PARACELSUS is "der Geist der stets verneint." He roused men against the dogmatism of the schools, and he stimulated enormously the practical study of chemistry. These are his great merits, against which must be placed a flood of hermetical and transcendental medicine, some his own, some foisted in his name, the influence of which is still with us.

"With what judgment ye judge it shall be judged to you again" is the verdict of three centuries on Paracelsus. In return for unmeasured abuse of his predecessors and contemporaries he has been held up to obloquy as the arch-charlatan of history. We have taken a cheap estimate of him from Fuller and Bacon, and from a host of scurrilous scribblers who debased or perverted his writings. Fuller picked him out as exemplifying the drunken quack, whose body was a sea wherein the tide of drunkenness was ever ebbing and flowing—"He boasted that shortly he would order Luther and the Pope, as well as he had done Galen and Hippocrates. He was never seen to pray, and seldome came to Church. He was not onely skilled in naturall Magick (the utmost bounds whereof border on the suburbs of hell) but is charged to converse constantly with familiars. Guilty he was of all vices but wantonnesse: . . ."

Francis Bacon, too, says many hard things of him. To the mystics, on the other hand, he is Paracelsus the Great, the divine, the most supreme of the Christian magi, whose writings are too precious for science, the monarch of secrets, who has discovered the Universal Medicine. This is illustrated in Browning's well-known poem "Paracelsus," published when he was only twenty-one; than which there is no more pleasant picture in literature of the man and of his aspirations. His was a "searching and impetuous soul" that sought to win from nature some startling secret—" . . . a tincture of force to flush old age with youth, or breed gold, or imprison moonbeams till they change to opal

shafts!" At the same time with that capacity for self-deception which characterizes the true mystic he sought to cast

> Light on a darkling race; save for that doubt,
> I stood at first where all aspire at last
> To stand: the secret of the world was mine.
> I knew, I felt (perception unexpressed,
> Uncomprehended by our narrow thought,
> But somehow felt and known in every shift
> And change in the spirit, nay, in every pore
> Of the body, even)— what God is, what we are,
> What life is— . . .

Much has been done of late to clear up his story and his character. Professor Sudhoff, of Leipzig, has made an exhaustive bibliographical study of his writings, there have been recent monographs by Julius Hartmann, and Professors Franz and Karl Strunz, and a sympathetic summary of his life and writings has been published by the late Miss Stoddart. Indeed there is at present a cult of Paracelsus. The hermetic and alchemical writings are available in English in the edition of A. E. Waite, London, 1894. The main facts of his life you can find in all the biographies. Suffice it here to say that he was born at Einsiedeln, near Zurich, in 1493, the son of a physician, from whom he appears to have had his early training both in medicine and in chemistry. Under the famous abbot and alchemist, Trithemiusof Wurzburg, he studied chemistry and occultism. After working in the mines at Schwatz he began his wanderings, during which he professes to have visited nearly all the countries in Europe and to have reached India and China. Returning to Germany he began a triumphal tour of practice through the German cities, always in opposition to the medical faculty, and constantly in trouble. He undoubtedly performed many important cures, and was thought to have found the supreme secret of alchemistry. In the pommel of his sword he was believed to carry a familiar spirit. So dominant was his reputation that in 1527 he was called to the chair of physic in the University of Basel. Embroiled in quarrels after his first year he was forced to leave secretly, and again began his wanderings through German cities, working, quarrelling, curing, and dying prematurely at Saltzburg in 1541one of the most tragic figures in the history of medicine.

Paracelsus is the Luther of medicine, the very incarnation of the spirit of revolt. At a period when authority was paramount, and men blindly followed old leaders, when to stray from the beaten track in any field of knowledge was a damnable heresy, he stood out boldly for independent study and the right of private judgment. After election to the chair at Basel he at once introduced a startling novelty by lecturing in German. He had caught the new spirit and was ready to burst all bonds both in medicine and in theology. He must have startled the old teachers and practitioners by his novel methods. "On June 5, 1527, he attached a programme of his lectures to the black-board of the University

inviting all to come to them. It began by greeting all students of the art of healing. He proclaimed its lofty and serious nature, a gift of God to man, and the need of developing it to new importance and to new renown. This he undertook to do, not retrogressing to the teaching of the ancients, but progressing whither nature pointed, through research into nature, where he himself had discovered and had verified by prolonged experiment and experience. He was ready to oppose obedience to old lights as if they were oracles from which one did not dare to differ. Illustrious doctor smight be graduated from books, but books made not a single physician.(10) Neither graduation, nor fluency, nor the knowledge of old languages, nor the reading of many books made a physician, but the knowledge of things themselves and their properties. The business of a doctor was to know the different kinds of sicknesses, their causes, their symptoms and their right remedies. This he would teach, for he had won this knowledge through experience, the greatest teacher, and with much toil. He would teach it as he had learned it, and his lectures would be founded on works which he had composed concerning inward and external treatment, physic and surgery." Shortly afterwards, at the Feast of St. John, the students had a bonfire in front of the university. Paracelsus came out holding in his hands the "Bible of medicine," Avicenna's "Canon," which he flung into the flames saying: "Into St. John's fire so that all misfortune may go into the air with the smoke." It was, as he explained afterwards, a symbolic act: "What has perished must go to the fire; it is no longer fit for use: what is true and living, that the fire cannot burn." With abundant confidence in his own capacity he proclaimed himself the legitimate monarch, the very Christ of medicine. "You shall follow me," cried he, "you, Avicenna, Galen, Rhasis, Montagnana, Mesues; you, Gentlemen of Paris, Montpellier, Germany, Cologne, Vienna, and whomsoever the Rhine and Danube nourish; you who inhabit the isles of the sea; you, likewise, Dalmatians, Athenians; thou, Arab; thou, Greek; thou, Jew; all shall follow me, and the monarchy shall be mine." This first great revolt against the slavish authority of the schools had little immediate effect, largely on account of the personal vagaries of the reformer but it made men think. Paracelsus stirred the pool as had not been done for fifteen centuries.

Much more important is the relation of Paracelsus to the new chemical studies, and their relation to practical medicine. Alchemy, he held, "is to make neither gold nor silver: its use is to make the supreme sciences and to direct them against disease." He recognized three basic substances, sulphur, mercury and salt, which were the necessary ingredients of all bodies organic or inorganic. They were the basis of the three principles out of which the Archaeus, the spirit of nature, formed all bodies. He made important discoveries in chemistry; zinc, the various compounds of mercury, calomel, flowers of sulphur, among others, and he was a strong advocate of the use of preparations of iron and antimony. In practical pharmacy he has perhaps had a greater reputation for the introduction of a tincture of opium—labdanum or laudanum—with which he effected miraculous cures, and the use of which he had probably learned in the East.

Through Paracelsus a great stimulus was given to the study of chemistry and pharmacy, and he is the first of the modern iatro-chemists. In contradistinction to

Galenic medicines, which were largely derived from the vegetable kingdom, from this time on we find in the literature references to spagyric medicines and a "spagyrist" was a Paracelsian who regarded chemistry as the basis of all medical knowledge.

One cannot speak very warmly of the practical medical writings of Paracelsus. Gout, which may be taken as the disease upon which he had the greatest reputation, is very badly described, and yet he has one or two fruitful ideas singularly mixed with mediaeval astrology; but he has here and there very happy insights, as where he remarks "nec praeter synoviam locqum alium ullum podagra occupat."(13) In the tract on phlebotomy I see nothing modern, and here again he is everywhere dominated by astrological ideas—"Sapiens dominatur astris."

(13) Geneva ed., 1658, Vol. I, p. 613.

As a protagonist of occult philosophy, Paracelsus has had a more enduring reputation than as a physician. In estimating his position there is the great difficulty referred to by Sudhoff in determining which of the extant treatises are genuine. In the two volumes issued in English by Waite in 1894, there is much that is difficult to read and to appreciate from our modern standpoint. In the book "Concerning Long Life" he confesses that his method and practice will not be intelligible to common persons and that he writes only for those whose intelligence is above the average. To those fond of transcendental studies they appeal and are perhaps intelligible. Everywhere one comes across shrewd remarks which prove that Paracelsus had a keen belief in the all-controlling powers of nature and of man's capacity to make those powers operate for his own good: "the wise man rules Nature, not Nature the wise man." "The difference between the Saint and the Magus is that the one operates by means of God, and the other by means of Nature." He had great faith in nature and the light of nature, holding that man obtains from nature according as he believes. His theory of the three principles appears to have controlled his conception of everything relating to man, spiritually, mentally and bodily; and his threefold genera of disease corresponded in some mysterious way with the three primary substances, salt, sulphur and mercury.

How far he was a believer in astrology, charms and divination it is not easy to say. From many of the writings in his collected works one would gather, as I have already quoted, that he was a strong believer. On the other hand, in the "Paramirum," he says: "Stars control nothing in us, suggest nothing, incline to nothing, own nothing; they are free from us and we are free from them" (Stoddart, p. 185). The Archaeus, not the stars, controls man's destiny. "Good fortune comes from ability, and ability comes from the spirit" (Archaeus).

No one has held more firmly the dualistic conception of the healing art. There are two kinds of doctors; those who heal miraculously and those who heal through medicine. Only he who believes can work miracles. The physician has to accomplish that which God would have done miraculously, had there been faith enough in the sick man (Stoddart, p. 194). He had the Hippocratic conception of the "vis medicatrix naturae" no one keener since the days of the Greeks. Man is his own doctor and finds proper

healing herbs in his own garden: the physician is in ourselves, in our own nature are all things that we need: and speaking of wounds, with singular prescience he says that the treatment should be defensive so that no contingency from without could hinder Nature in her work (Stoddart, p. 213).

Paracelsus expresses the healing powers of nature by the word "mumia," which he regarded as a sort of magnetic influence or force, and he believed that anyone possessing this could arrest or heal disease in others. As the lily breaks forth in invisible perfume, so healing influences may pass from an invisible body. Upon these views of Paracelsus was based the theory of the sympathetic cure of disease which had an extraordinary vogue in the late sixteenth and seventeenth centuries, and which is not without its modern counterpart.

In the next century, in Van Helmont we meet with the Archaeus everywhere presiding, controlling and regulating the animate and inanimate bodies, working this time through agents, local ferments. The Rosicrucians had their direct inspiration from his writings, and such mystics as the English Rosicrucian Fludd were strong Paracelsians.

The doctrine of contraries drawn from the old Greek philosophy, upon which a good deal of the treatment of Hippocrates and Galen was based dryness expelled by moisture, cold by heat, etc. was opposed by Paracelsus in favor of a theory of similars, upon which the practice of homeopathy is based. This really arose from the primitive beliefs, to which I have already referred as leading to the use of eyebright in diseases of the eye, and cyclamen in diseases of the ear because of its resemblance to that part; and the Egyptian organotherapy had the same basis spleen would cure spleen, heart, heart, etc. In the sixteenth and seventeenth centuries these doctrines of sympathies and antipathies were much in vogue. A Scotchman, Sylvester Rattray, edited in the "Theatrum Sympatheticum" all the writings upon the sympathies and antipathies of man with animal, vegetable and mineral substances, and the whole art of physics was based on this principle.

Upon this theory of "mumia," or magnetic force, the sympathetic cure of disease was based. The weapon salve, the sympathetic ointment, and the famous powder of sympathy were the instruments through which it acted. The magnetic cure of wounds became the vogue. Van Helmont adopted these views in his famous treatise "De Magnetica Vulnerum Curatione," in which he asserted that cures were wrought through magnetic influence. How close they came to modern views of wound infection may be judged from the following: "Upon the solution of Unity in any part the ambient air . . . repleted with various evaporations or aporrhoeas of mixt bodies, especially such as are then suffering the act of putrefaction, violently invadeth the part and thereupon impresseth an exotic miasm or noxious diathesis, which disposeth the blood successively arriving at the wound, to putrefaction, by the intervention of fermentation." With his magnetic sympathy, Van Helmont expressed clearly the doctrine of immunity and the cure of disease by immune sera: "For he who has once recovered from that disease hath not only obtained a pure balsaamical blood, whereby for the future he is rendered free from any recidivation of the same evil, but also infallibly cures the same affection in

his neighbour . . . and by the mysterious power of Magnetism transplants that balsaam and conserving quality into the blood of another." He was rash enough to go further and say that the cures effected by the relics of the saints were also due to the same cause a statement which led to a great discussion with the theologians and to Van Helmont's arrest for heresy, and small wonder, when he makes such bold statements as "Let the Divine enquire only concerning God, the Naturalist concerning Nature," and "God in the production of miracles does for the most part walk hand in hand with Nature."

That wandering genius, Sir Kenelm Digby, did much to popularize this method of treatment by his lecture on the "Powder of Sympathy." His powder was composed of copperas alone or mixed with gum tragacanth. He regarded the cure as effected through the subtle influence of the sympathetic spirits or, as Highmore says, by "atomicall energy wrought at a distance," and the remedy could be applied to the wound itself, or to a cloth soaked in the blood or secretions, or to the weapon that caused the wound. One factor leading to success may have been that in the directions which Digby gave for treating the wound (in the celebrated case of James Howell, for instance), it was to be let alone and kept clean. The practice is alluded to very frequently by the poets. In the "Lay of the Last Minstrel" we find the following:

> But she has ta'en the broken lance,
> And wash'd it from the clotted gore,
> And salved the splinter o'er and o'er.
> William of Deloraine, in trance,
> Whene'er she turn'd it round and round,
> Twisted, as if she gall'd his wound,
> Then to her maidens she did say,
> That he should be whole man and sound,
>
> (Canto iii, xxiii.)
> and in Dryden's "Tempest" (V, 1) Ariel says:
> Anoint the Sword which pierc'd him with the Weapon-Salve,
> And wrap it close from Air till I have time
> To visit him again.

From Van Helmont comes the famous story of the new nose that dropped off in sympathy with the dead arm from which it was taken, and the source of the famous lines of Hudibras. As I have not seen the original story quoted of late years it may be worth while to give it: "A certain inhabitant of Bruxels, in a combat had his nose mowed off, addressed himself to Tagliacozzus, a famous Chirurgein, living at Bononia, that he might procure a new one; and when he feared the incision of his own arm, he hired a Porter to admit it, out of whose arm, having first given the reward agreed upon, at length he dig'd a new nose. About thirteen moneths after his return to his own Countrey, on a sudden the ingrafted nose grew cold, putrified, and within few days drops off. To

those of his friends that were curious in the exploration of the cause of this unexpected misfortune, it was discovered, that the Porter expired, neer about the same punctilio of time, wherein the nose grew frigid and cadaverous. There are at Bruxels yet surviving, some of good repute, that were eye-witnesses of these occurrences."

Equally in the history of science and of medicine, 1542 is a starred year, marked by a revolution in our knowledge alike of Macrocosm and Microcosm. In Frauenburg, the town physician and a canon, now nearing the Psalmist limit and his end, had sent to the press the studies of a lifetime. "De revolutionibus orbium coelestium." It was no new thought, no new demonstration that Copernicus thus gave to his generation. Centuries before, men of the keenest scientific minds from Pythagoras on had worked out a heliocentric theory, fully promulgated by Aristarchus, and very generally accepted by the brilliant investigators of the Alexandrian school; but in the long interval, lapped in Oriental lethargy, man had been content to acknowledge that the heavens declare the glory of God and that the firmament sheweth his handiwork. There had been great astronomers before Copernicus. In the fifteenth century Nicholas of Cusa and Regiomontanus had hinted at the heliocentric theory; but 1512 marks an epoch in the history of science, since for all time Copernicus put the problem in a way that compelled acquiescence.

Nor did Copernicus announce a truth perfect and complete, not to be modified, but there were many contradictions and lacunae which the work of subsequent observers had to reconcile and fill up. For long years Copernicus had brooded over the great thoughts which his careful observation had compelled. We can imagine the touching scene in the little town when his friend Osiander brought the first copy of the precious volume hot from the press, a well enough printed book. Already on his deathbed, stricken with a long illness, the old man must have had doubts how his work would be received, though years before Pope Clement VII had sent him encouraging words. Fortunately death saved him from the "rending" which is the portion of so many innovators and discoverers. His great contemporary reformer, Luther, expressed the view of the day when he said the fool will turn topsy-turvy the whole art of astronomy; but the Bible says that Joshua commanded the Sun to stand still, not the Earth. The scholarly Melanchthon, himself an astronomer, thought the book so godless that he recommended its suppression (Dannemann, Grundriss). The church was too much involved in the Ptolemaic system to accept any change and it was not until 1822 that the works of Copernicus were removed from the Index.

VESALIUS

THE same year, 1542, saw a very different picture in the far-famed city of Padua, "nursery of the arts." The central figure was a man not yet in the prime of life, and justly full of its pride, as you may see from his portrait. Like Aristotle and Hippocrates cradled and nurtured in an AEsculapian family, Vesalius was from his childhood a student of nature, and was now a wandering scholar, far from his Belgian home. But in Italy he

had found what neither Louvain nor Paris could give, freedom in his studies and golden opportunities for research in anatomy. What an impression he must have made on the student body at Padua may be judged from the fact that shortly after his graduation in December, 1537, at the age of twenty-four, he was elected to the chair of anatomy and surgery. Two things favored him— an insatiate desire to see and handle for himself the parts of the human frame, and an opportunity, such as had never before been offered to the teacher, to obtain material for the study of human anatomy. Learned with all the learning of the Grecians and of the Arabians, Vesalius grasped, as no modern before him had done, the cardinal fact that to know the human machine and its working, it is necessary first to know its parts—its fabric.

To appreciate the work of this great man we must go back in a brief review of the growth of the study of anatomy.

Among the Greeks only the Alexandrians knew human anatomy. What their knowledge was we know at second hand, but the evidence is plain that they knew a great deal. Galen's anatomy was first-class and was based on the Alexandrians and on his studies of the ape and the pig. We have already noted how much superior was his osteology to that of Mundinus. Between the Alexandrians and the early days of the School of Salernum we have no record of systematic dissections of the human body. It is even doubtful if these were permitted at Salernum. Neuburger states that the instructions of Frederick II as to dissections were merely nominal.

How atrocious was the anatomy of the early Middle Ages may be gathered from the cuts in the works of Henri de Mondeville. In the Bodleian Library is a remarkable Latin anatomical treatise of the late thirteenth century, of English provenance, one illustration from which will suffice to show the ignorance of the author. Mundinus of Bologna, one of the first men in the Middle Ages to study anatomy from the subject, was under the strong domination of the Arabians, from whom he appears to have received a very imperfect Galenic anatomy. From this date we meet with occasional dissections at various schools, but we have seen that in the elaborate curriculum of the University of Padua in the middle of the fifteenth century there was no provision for the study of the subject. Even well into the sixteenth century dissections were not common, and the old practice was followed of holding a professorial discourse, while the butcher, or barber surgeon, opened the cavities of the body. A member of a famous Basel family of physicians, Felix Plater, has left us in his autobiography details of the dissections he witnessed at Montpellier between November 14, 1552, and January 10, 1557, only eleven in number. How difficult it was at that time to get subjects is shown by the risks they ran in "body-snatching" expeditions, of which he records three.

And now came the real maker of modern anatomy. Andreas Vesalius had a good start in life. Of a family long associated with the profession, his father occupied the position of apothecary to Charles V, whom he accompanied on his journeys and campaigns. Trained at Louvain, he had, from his earliest youth, an ardent desire to dissect, and cut up mice and rats, and even cats and dogs. To Paris, the strong school of the period, he went in 1533, and studied under two men of great renown, Jacob Sylvius and Guinterius.

Both were strong Galenists and regarded the Master as an infallible authority. He had as a fellow prosector, under the latter, the unfortunate Servetus. The story of his troubles and trials in getting bones and subjects you may read in Roth's "Life." Many interesting biographical details are also to be found in his own writings. He returned for a time to Louvain, and here he published his first book, a commentary on the "Almansor" of Rhazes, in 1537.

Finding it difficult, either in Paris or Louvain, to pursue his anatomical studies, he decided to go to Italy where, at Venice and Padua, the opportunities were greater. At Venice, he attended the practice of a hospital (now a barracks) which was in charge of the Theatiner Order. I show you a photograph of the building taken last year. And here a strange destiny brought two men together. In 1537, another pilgrim was working in Venice waiting to be joined by his six disciples. After long years of probation, Ignatius Loyola was ready to start on the conquest of a very different world. Devoted to the sick and to the poor, he attached himself to the Theatiner Order, and in the wards of the hospital and the quadrangle, the fiery, dark-eyed, little Basque must frequently have come into contact with the sturdy young Belgian, busy with his clinical studies and his anatomy. Both were to achieve phenomenal success—the one in a few years to revolutionize anatomy, the other within twenty years to be the controller of universities, the counsellor of kings, and the founder of the most famous order in the Roman Catholic Church. It was in this hospital that Vesalius made observations on the China-root, on which he published a monograph in 1546. The Paduan School was close to Venice and associated with it, so that the young student had probably many opportunities of going to and fro. On the sixth of December, 1537, before he had reached his twenty-fourth year and shortly after taking his degree, he was elected to the chair of surgery and anatomy at Padua.

The task Vesalius set himself to accomplish was to give an accurate description of all the parts of the human body, with proper illustrations. He must have had abundant material, more, probably, than any teacher before him had ever had at his disposal. We do not know where he conducted his dissections, as the old amphitheatre has disappeared, but it must have been very different from the tiny one put up by his successor, Fabricius, in 1594. Possibly it was only a temporary building, for he says in the second edition of the "Fabrica" that he had a splendid lecture theatre which accommodated more than five hundred spectators (p. 681).

With Vesalius disappeared the old didactic method of teaching anatomy. He did his own dissections, made his own preparations, and, when human subjects were scarce, employed dogs, pigs or cats, and occasionally a monkey. For five years he taught and worked at Padua. He is known to have given public demonstrations in Bologna and elsewhere. In the "China-root" he remarks that he once taught in three universities in one year. The first fruit of his work is of great importance in connection with the evolution of his knowledge. In 1538, he published six anatomical tables issued apparently in single leaves. Of the famous "Tabulae Anatomicae" only two copies are known, one in the San Marco Library, Venice, and the other in the possession of Sir John Stirling-Maxwell,

whose father had it reproduced in facsimile (thirty copies only) in 1874. Some of the figures were drawn by Vesalius himself, and some are from the pencil of his friend and countryman, Stephan van Calcar. Those plates were extensively pirated. About this time he also edited for the Giunti some of the anatomical works of Galen.

We know very little of his private life at Padua. His most important colleague in the faculty was the famous Montanus, professor of medicine. Among his students and associates was the Englishman Caius, who lived in the same house with him. When the output is considered, he cannot have had much spare time at Padua.

He did not create human anatomy that had been done by the Alexandrians but he studied it in so orderly and thorough a manner that for the first time in history it could be presented in a way that explained the entire structure of the human body. Early in 1542 the MS. was ready; the drawings had been made with infinite care, the blocks for the figures had been cut, and in September, he wrote to Oporinus urging that the greatest pains should be taken with the book, that the paper should be strong and of equal thickness, the workmen chosen for their skill, and that every detail of the pictures must be distinctly visible. He writes with the confidence of a man who realized the significance of the work he had done. It is difficult to speak in terms of moderation of the "Fabrica." To appreciate its relative value one must compare it with the other anatomical works of the period, and for this purpose I put before you two figures from a text-book on the subject that was available for students during the first half of the sixteenth century. In the figures and text of the "Fabrica" we have anatomy as we know it; and let us be honest and say, too, largely as Galen knew it. Time will not allow me to go into the question of the relations of these two great anatomists, but we must remember that at this period Galen ruled supreme, and was regarded in the schools as infallible. And now, after five years of incessant labor, Vesalius was prepared to leave his much loved Padua and his devoted students. He had accomplished an extraordinary work. He knew, I feel sure, what he had done. He knew that the MSS. contained something that the world had not seen since the great Pergamenian sent the rolls of his "Manual of Anatomy" among his friends. Too precious to entrust to any printer but the best and the best in the middle of the sixteenth century was Transalpine he was preparing to go north with the precious burden. We can picture the youthful teacher he was but twenty-eightamong students in a university which they themselves controlled some of them perhaps the very men who five years before had elected him at the last meeting with his class, perhaps giving a final demonstration of the woodcuts, which were of an accuracy and beauty never seen before by students' eyes, and reading his introduction. There would be sad hearts at the parting, for never had anyone taught anatomy as he had taught it no one had ever known anatomy as he knew it. But the strong, confident look was on his face and with the courage of youth and sure of the future, he would picture a happy return to attack new and untried problems. Little did he dream that his happy days as student and teacher were finished, that his work as an anatomist was over, that the most brilliant and epoch-making part of his career as a professor was a thing of the past. A year or more was spent at Basel with his friend Oporinus supervising the printing of the great work,

which appeared in 1543 with the title "De Humani Corporis Fabrica." The worth of a book, as of a man, must be judged by results, and, so judged, the "Fabrica" is one of the great books of the world, and would come in any century of volumes which embraced the richest harvest of the human mind. In medicine, it represents the full flower of the Renaissance. As a book it is a sumptuous tome a worthy setting of his jewel— paper, type and illustration to match, as you may see for yourselves in this folio the chef d'oeuvre of any medical library.

In every section, Vesalius enlarged and corrected the work of Galen. Into the details we need not enter: they are all given in Roth's monograph, and it is a chapter of ancient history not specially illuminating.

Never did a great piece of literary work have a better setting. Vesalius must have had a keen appreciation of the artistic side of the art of printing, and he must also have realized the fact that the masters of the art had by this time moved north of the Alps.

While superintending the printing of the precious work in the winter of 1542-1543 in Basel, Vesalius prepared for the medical school a skeleton from the body of an executed man, which is probably the earliest preparation of the kind in Europe. How little anatomy had been studied at the period may be judged from that fact that there had been no dissection at Basel since 1531. The specimen is now in the Vesalianum, Basel, of which I show you a picture taken by Dr. Harvey Cushing. From the typographical standpoint no more superb volume on anatomy has been issued from any press, except indeed the second edition, issued in 1555. The paper is, as Vesalius directed, strong and good, but it is not, as he asked, always of equal thickness; as a rule it is thick and heavy, but there are copies on a good paper of a much lighter quality. The illustrations drawn by his friend and fellow countryman, van Calcar, are very much in advance of anything previously seen, except those of Leonardo. The title-page, one of the most celebrated pictures in the history of medicine, shows Vesalius in a large amphitheatre (an imaginary one of the artist, I am afraid) dissecting a female subject. He is demonstrating the abdomen to a group of students about the table, but standing in the auditorium are elderly citizens and even women. One student is reading from an open book. There is a monkey on one side of the picture and a dog on the other. Above the picture on a shield are the three weasels, the arms of Vesal. The reproduction which I show you here is from the "Epitome" a smaller work issued before (?) the "Fabrica," with rather larger plates, two of which represent nude human bodies and are not reproduced in the great work. The freshest and most beautiful copy is the one on vellum which formerly belonged to Dr. Mead, now in the British Museum, and from it this picture was taken. One of the most interesting features of the book are the full-page illustrations of the anatomy of the arteries, veins and nerves. They had not in those days the art of making corrosion preparations, but they could in some way dissect to their finest ramifications the arteries, veins and nerves, which were then spread on boards and dried. Several such preparations are now at the College of Physicians in London, brought from Padua by Harvey. The plates of the muscles are remarkably good, more correct, though not better perhaps, on the whole, than some of Leonardo's.

Vesalius had no idea of a general circulation. Though he had escaped from the domination of the great Pergamenian in anatomy, he was still his follower in physiology. The two figures annexed, taken from one of the two existing copies of the "Tabulae Anatomica," are unique in anatomical illustration, and are of special value as illustrating the notion of the vascular system that prevailed until Harvey's day. I have already called your attention to Galen's view of the two separate systems, one containing the coarse, venous blood for the general nutrition of the body, the other the arterial, full of a thinner, warmer blood with which were distributed the vital spirits and the vital heat. The veins had their origin in the liver; the superior vena cava communicated with the right heart, and, as Galen taught, some blood was distributed to the lungs; but the two systems were closed, though Galen believed there was a communication at the periphery between the arteries and veins. Vesalius accepted Galen's view that there is some communication between the venous and arterial systems through pores in the septum of the ventricles, though he had his doubts, and in the second edition of his book (1555) says that inspite of the authority of the Prince of Physicians he cannot see how the smallest quantity of blood could be transmitted through so dense a muscular septum. Two years before this (1553),(*) his old fellow student, Michael Servetus, had in his "Christianismi Restitutio" annatomical touch with one another!

The publication of the "Fabrica" shook the medical world to its foundations. Galen ruled supreme in the schools: to doubt him in the least particular roused the same kind of feeling as did doubts on the verbal inspiration of the Scriptures fifty years ago! His old teachers in Paris were up in arms: Sylvius, nostrae aetatis medicorum decus, as Vesalius calls him, wrote furious letters, and later spoke of him as a madman (vaesanus). The younger men were with him and he had many friends, but he had aroused a roaring tide of detraction against which he protested a few years later in his work on the "China-root," which is full of details about the "Fabrica." In a fit of temper he threw his notes on Galen and other MSS. in the fire. No sadder page exists in medical writings than the one in which Vesalius tells of the burning of his books and MSS. It is here reproduced and translated. His life for a couple of years is not easy to follow, but we know that in 1546 he took service with Charles V as his body physician, and the greatest anatomist of his age was lost in the wanderings of court and campaigns. He became an active practitioner, a distinguished surgeon, much consulted by his colleagues, and there are references to many of his cases, the most important of which are to internal aneurysms, which he was one of the first to recognize. In 1555 he brought out the second edition of the "Fabrica," an even more sumptuous volume than the first.

"All these impediments I made light of; for I was too young to seek gain by my art, and I was sustained by my eager desire to learn and to promote the studies in which I shared. I say nothing of my diligence in anatomizing— those who attended my lectures in Italy know how I spent three whole weeks over a single public dissection. But consider that in one year I once taught in three different universities. If I had put off the task of writing till this time; if I were now just beginning to digest my materials; students would not have had the use of my anatomical labours, which posterity may or may not

judge superior to the rechauffes formerly in use, whether of Mesua, of Gatinaria, of some Stephanus or other on the differences, causes and symptoms of diseases, or, lastly, of a part of Servitor's pharmacopoeia. As to my notes, which had grown into a huge volume, they were all destroyed by me; and on the same day there similarly perished the whole of my paraphrase on the ten books of Rhazes to King Almansor, which had been composed by me with far more care than the one which is prefaced to the ninth book. With these also went the books of some author or other on the formulae and preparation of medicines, to which I had added much matter of my own which I judged to be not without utility; and the same fate overtook all the books of Galen which I had used in learning anatomy, and which I had liberally disfigured in the usual fashion. I was on the point of leaving Italy and going to Court; those physicians you know of had made to the Emperor and to the nobles a most unfavourable report of my books and of all that is published nowadays for the promotion of study; I therefore burnt all these works that I have mentioned, thinking at the same time that it would be an easy matter to abstain from writing for the future. I must show that I have since repented more than once of my impatience, and regretted that I did not take the advice of the friends who were then with me."

There is no such pathetic tragedy in the history of our profession. Before the age of thirty Vesalius had effected a revolution in anatomy; he became the valued physician of the greatest court of Europe; but call no man happy till he is dead! A mystery surrounds his last days. The story is that he had obtained permission to perform a post-mortem examination on the body of a young Spanish nobleman, whom he had attended. When the body was opened, the spectators to their horror saw the heart beating, and there were signs of life! Accused, so it is said, by the Inquisition of murder and also of general impiety he only escaped through the intervention of the King, with the condition that he make a pilgrimage to the Holy Land. In carrying this out in 1564 he was wrecked on the island of Zante, where he died of a fever or of exhaustion, in the fiftieth year of his age.

To the North American Review, November, 1902, Edith Wharton contributed a poem on "Vesalius in Zante," in which she pictures his life, so full of accomplishment, so full of regrets accentuated by the receipt of an anatomical treatise by Fallopius, the successor to the chair in Padua! She makes him say:

> There are two ways of spreading light; to be
> The candle or the mirror that reflects it.
> I let my wick burn out there yet remains
> To spread an answering surface to the flame
> That others kindle.

But between Mundinus and Vesalius, anatomy had been studied by a group of men to whom I must, in passing, pay a tribute. The great artists Raphael, Michael Angelo and Albrecht Durer were keen students of the human form. There is an anatomical sketch by

Michael Angelo in the Ashmolean Museum, Oxford, which I here reproduce.(*) Durer's famous work on "Human Proportion," published in 1528, contains excellent figures, but no sketches of dissections. But greater than any of these, and antedating them, is Leonardo da Vinci, the one universal genius in whom the new spirit was incarnate—the Moses who alone among his contemporaries saw the promised land. How far Leonardo was indebted to his friend and fellow student, della Torre, at Pavia we do not know, nor does it matter in face of the indubitable fact that in the many anatomical sketches from his hand we have the first accurate representation of the structure of the body. Glance at the three figures of the spine which I have had photographed side by side, one from Leonardo, one from Vesalius and the other from Vandyke Carter, who did the drawings in Gray's "Anatomy" (1st ed., 1856). They are all of the same type, scientific, anatomical drawings, and that of Leonardo was done fifty years before Vesalius! Compare, too, this figure of the bones of the foot with a similar one from Vesalius. Insatiate in experiment, intellectually as greedy as Aristotle, painter, poet, sculptor, engineer, architect, mathematician, chemist, botanist, aeronaut, musician and withal a dreamer and mystic, full accomplishment in any one department was not for him! A passionate desire for a mastery of nature's secrets made him a fierce thing, replete with too much rage! But for us a record remains Leonardo was the first of modern anatomists, and fifty years later, into the breach he made, Vesalius entered.(25)

HARVEY

LET us return to Padua about the year 1600. Vesalius, who made the school the most famous anatomical centre in Europe, was succeeded by Fallopius, one of the best-known names in anatomy, at whose death an unsuccessful attempt was made to get Vesalius back. He was succeeded in 1565 by a remarkable man, Fabricius (who usually bears the added name of Aquapendente, from the town of his birth), a worthy follower of Vesalius. In 1594, in the thirtieth year of his professoriate, he built at his own expense a new anatomical amphitheatre, which still exists in the university buildings. It is a small, high-pitched room with six standing-rows for auditors rising abruptly one above the other. The arena is not much more than large enough for the dissecting table which, by a lift, could be brought up from a preparing room below. The study of anatomy at Padua must have declined since the days of Vesalius if this tiny amphitheatre held all its students; none the less, it is probably the oldest existing anatomical lecture room, and for us it has a very special significance.

Early in his anatomical studies Fabricius had demonstrated the valves in the veins. I show you here two figures, the first, as far as I know, in which these structures are depicted. It does not concern us who first discovered them; they had doubtless been seen before, but Fabricius first recognized them as general structures in the venous system, and he called them little doors "ostiola."

The quadrangle of the university building at Padua is surrounded by beautiful arcades, the walls and ceilings of which are everywhere covered with the stemmata, or

shields, of former students, many of them brilliantly painted. Standing in the arcade on the side of the "quad" opposite the entrance, if one looks on the ceiling immediately above the capital of the second column to the left there is seen the stemma which appears as tailpiece to this chapter, put up by a young Englishman, William Harvey, who had been a student at Padua for four years. He belonged to the "Natio Anglica," of which he was Conciliarius, and took his degree in 1602. Doubtless he had repeatedly seen Fabricius demonstrate the valves of the veins, and he may indeed, as a senior student, have helped in making the very dissections from which the drawings were taken for Fabricius' work, "De Venarum Osteolis," 1603. If one may judge from the character of the teacher's work the sort of instruction the student receives, Harvey must have had splendid training in anatomy. While he was at Padua, the great work of Fabricius, "De Visione, Voce et Auditu" (1600) was published, then the "Tractatus de Oculo Visusque Organo" (1601), and in the last year of his residence Fabricius must have been busy with his studies on the valves of the veins and with his embryology, which appeared in 1604. Late in life, Harvey told Boyle that it was the position of the valves of the veins that induced him to think of a circulation.

Harvey returned to England trained by the best anatomist of his day. In London, he became attached to the College of Physicans, and taking his degree at Cambridge, he began the practice of medicine. He was elected a fellow of the college in 1607 and physician to St. Bartholomew's Hospital in 1609. In 1615 he was appointed Lumleian lecturer to the College of Physicians, and his duties were to hold certain "public anatomies," as they were called, or lectures. We know little or nothing of what Harvey had been doing other than his routine work in the care of the patients at St. Bartholomew's. It was not until April, 1616, that his lectures began. Chance has preserved to us the notes of this first course; the MS. is now in the British Museum and was published in facsimile by the college in 1886.The second day lecture, April 17, was concerned with a description of the organs of the thorax, and after a discussion on the structure and action of the heart come the lines:

> W. H. constat per fabricam cordis sanguinem
> per pulmones in Aortam perpetuo
> transferri, as by two clacks of a
> water bellows to rayse water
> constat per ligaturam transitum sanguinis
> ab arteriis ad venas
> unde perpetuum sanguinis motum
> in circulo fieri pulsu cordis.

The illustration will give one an idea of the extraordinarily crabbed hand in which the notes are written, but it is worth while to see the original, for here is the first occasion upon which is laid down in clear and unequivocal words that the blood CIRCULATES. The lecture gave evidence of a skilled anatomist, well versed in the literature from

Aristotle to Fabricius. In the MS. of the thorax, or, as he calls it, the "parlour" lecture, there are about a hundred references to some twenty authors. The remarkable thing is that although those lectures were repeated year by year, we have no evidence that they made any impression upon Harvey's contemporaries, so far, at least, as to excite discussions that led to publication. It was not until twelve years later, 1628, that Harvey published in Frankfurt a small quarto volume of seventy-four pages, "De Motu Cordis." In comparison with the sumptuous "Fabrica" of Vesalius this is a trifling booklet; but if not its equal in bulk or typographical beauty (it is in fact very poorly printed), it is its counterpart in physiology, and did for that science what Vesalius had done for anatomy, though not in the same way. The experimental spirit was abroad in the land, and as a student at Padua, Harvey must have had many opportunities of learning the technique of vivisection; but no one before his day had attempted an elaborate piece of experimental work deliberately planned to solve a problem relating to the most important single function of the body. Herein lies the special merit of his work, from every page of which there breathes the modern spirit. To him, as to Vesalius before him, the current views of the movements of the blood were unsatisfactory, more particularly the movements of the heart and arteries, which were regarded as an active expansion by which they were filled with blood, like bellows with air. The question of the transmission of blood through the thick septum and the transference of air and blood from the lungs to the heart were secrets which he was desirous of searching out by means of experiment.

One or two special points in the work may be referred to as illustrating his method. He undertook first the movements of the heart, a task so truly arduous and so full of difficulties that he was almost tempted to think with Fracastorius that "the movement of the heart was only to be comprehended by God." But after many difficulties he made the following statements: first, that the heart is erected and raises itself up into an apex, and at this time strikes against the breast and the pulse is felt externally; secondly, that it is contracted every-way, but more so at the sides; and thirdly, that grasped in the hand it was felt to become harder at the time of its motion; from all of which actions Harvey drew the very natural conclusion that the activity of the heart consisted in a contraction of its fibres by which it expelled the blood from the ventricles. These were the first four fundamental facts which really opened the way for the discovery of the circulation, as it did away with the belief that the heart in its motion attracts blood into the ventricles, stating on the contrary that by its contraction it expelled the blood and only received it during its period of repose or relaxation. Then he proceeded to study the action of the arteries and showed that their period of diastole, or expansion, corresponded with the systole, or contraction, of the heart, and that the arterial pulse follows the force, frequency and rhythm of the ventricle and is, in fact, dependent upon it. Here was another new fact: that the pulsation in the arteries was nothing else than the impulse of the blood within them. Chapter IV, in which he describes the movements of the auricles and ventricles, is a model of accurate description, to which little has since been added. It is interesting to note that he mentions what is probably auricular fibrillation. He says: "After the heart had ceased pulsating an undulation or palpitation remained in the blood itself which was

contained in the right auricle, this being observed so long as it was imbued with heat and spirit." He recognized too the importance of the auricles as the first to move and the last to die. The accuracy and vividness of Harvey's description of the motion of the heart have been appreciated by generations of physiologists. Having grasped this first essential fact, that the heart was an organ for the propulsion of blood, he takes up in Chapters VI and VII the question of the conveyance of the blood from the right side of the heart to the left. Galen had already insisted that some blood passed from the right ventricle to the lungs enough for their nutrition; but Harvey points out, with Colombo, that from the arrangement of the valves there could be no other view than that with each impulse of the heart blood passes from the right ventricle to the lungs and so to the left side of the heart. How it passed through the lungs was a problem: probably by a continuous transudation. In Chapters VIII and IX he deals with the amount of blood passing through the heart from the veins to the arteries. Let me quote here what he says, as it is of cardinal import:

"But what remains to be said upon the quantity and source of the blood which thus passes, is of a character so novel and unheard of that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom become a second nature. Doctrine once sown strikes deeply its root, and respect for antiquity influences all men. Still the die is cast, and my trust is in my love of truth, and the candour of cultivated minds." Then he goes on to say:

"I began to think whether there might not be A MOVEMENT, AS IT WERE, IN A CIRCLE. Now this I afterwards found to be true; and I finally saw that the blood, forced by the action of the left ventricle into the arteries, was distributed to the body at large, and its several parts, in the same manner as it is sent through the lungs, impelled by the right ventricle into the pulmonary artery, and that it then passed through the veins and along the vena cava, and so round to the left ventricle in the manner already indicated."

The experiments dealing with the transmission of blood in the veins are very accurate, and he uses the old experiment that Fabricius had employed to show the valves, to demonstrate that the blood in the veins flows towards the heart. For the first time a proper explanation of the action of the valves is given. Harvey had no appreciation of how the arteries and veins communicated with each other. Galen, you may remember, recognized that there were anastomoses, but Harvey preferred the idea of filtration.

The "De Motu Cordis" constitutes a unique piece of work in the history of medicine. Nothing of the same type had appeared before. It is a thoroughly sensible, scientific study of a definite problem, the solution of which was arrived at through the combination of accurate observation and ingenious experiment. Much misunderstanding has arisen in connection with Harvey's discovery of the circulation of the blood. He did not discover that the blood moved,—that was known to Aristotle and to Galen, from both of whom I have given quotations which indicate clearly that they knew of its movement,—but at

the time of Harvey not a single anatomist had escaped from the domination of Galen's views. Both Servetus and Colombo knew of the pulmonary circulation, which was described by the former in very accurate terms. Cesalpinus, a great name in anatomy and botany, for whom is claimed the discovery of the circulation, only expressed the accepted doctrines in the following oft-quoted phrase:

> "We will now consider how the attraction of aliment and the process of nutrition takes place in plants; for in animals we see the aliment brought through the veins to the heart, as to a laboratory of innate heat, and, after receiving there its final perfection, distributed through the arteries to the body at large, by the agency of the spirits produced from this same aliment in the heart." There is nothing in this but Galen's view, and Cesalpinus believed, as did all his contemporaries, that the blood was distributed through the body by the vena cava and its branches for the nourishment of all its parts.(*) To those who have any doubts as to Harvey's position in this matter I would recommend the reading of the "De Motu Cordis" itself, then the various passages relating to the circulation from Aristotle to Vesalius. Many of these can be found in the admirable works of Dalton, Flourens, Richet and Curtis. In my Harveian Oration for 1906(32) I have dealt specially with the reception of the new views, and have shown how long it was before the reverence for Galen allowed of their acceptance. The University of Paris opposed the circulation of the blood for more than half a century after the appearance of the "De Motu Cordis."

To summarize until the seventeenth century there were believed to be two closed systems in the circulation, the natural, containing venous blood, had its origin in the liver from which, as from a fountain, the blood continually ebbed and flowed for the nourishment of the body; the vital, containing another blood and the spirits, ebbed and flowed from the heart, distributing heat and life to all parts. Like a bellows the lungs fanned and cooled this vital blood. Here and there we find glimmering conceptions of a communication between these systems, but practically all teachers believed that the only one of importance was through small pores in the wall separating the two sides of the heart. Observation merely looking at and thinking about things had done all that was possible, and further progress had to await the introduction of a new method, viz., experiment. Galen, it is true, had used this means to show that the arteries of the body contained blood and not air. The day had come when men were no longer content with accurate description and with finely spun theories and dreams. It was reserved for the immortal Harvey to put into practice the experimental method by which he demonstrated conclusively that the blood moved in a circle. The "De Motu Cordis" marks the final break of the modern spirit with the old traditions. It took long for men to realize the value of this "inventum mirabile" used so effectively by the Alexandrians by Galen indeed, its full value has only been appreciated within the past century. Let me quote a paragraph

from my Harveian Oration. "To the age of the hearer, in which men had heard and heard only, had succeeded the age of the eye in which men had seen and had been content only to see. But at last came the age of the hand the thinking, devising, planning hand, the hand as an instrument of the mind, now re-introduced into the world in a modest little monograph from which we may date the beginning of experimental medicine."

Harvey caught the experimental spirit in Italy, with brain, eye and hand as his only aids, but now an era opened in which medicine was to derive an enormous impetus from the discovery of instruments of precision. "The new period in the development of the natural sciences, which reached its height in the work of such men as Galileo, Gilbert and Kepler, is chiefly characterized by the invention of very important instruments for aiding and intensifying the perceptions of the senses, by means of which was gained a much deeper insight into the phenomena than had hitherto been possible. Such instruments as the earlier ages possessed were little more than primitive hand-made tools. Now we find a considerable number of scientifically made instruments deliberately planned for purposes of special research, and as it were, on the threshold of the period stand two of the most important, the compound microscope and the telescope. The former was invented about 1590 and the latter about 1608." It was a fellow professor of the great genius Galileo who attempted to put into practice the experimental science of his friend. With Sanctorius began the studies of temperature, respiration and the physics of the circulation. The memory of this great investigator has not been helped by the English edition of his "De Statica Medicina," not his best work, with a frontispiece showing the author in his dietetic balance. Full justice has been done to him by Dr. Weir Mitchell in an address as president of the Congress of Physicians and Surgeons, 1891. Sanctorius worked with a pulsilogue devised for him by Galileo, with which he made observations on the pulse. He is said to have been the first to put in use the clinical thermometer. His experiments on insensible perspiration mark him as one of the first modern physiologists.

But neither Sanctorius nor Harvey had the immediate influence upon their contemporaries which the novel and stimulating character of their work justified. Harvey's great contemporary, Bacon, although he lost his life in making a cold storage experiment, did not really appreciate the enormous importance of experimental science. He looked very coldly upon Harvey's work. It was a philosopher of another kidney, Rene Descartes, who did more than anyone else to help men to realize the value of the better way which Harvey had pointed out. That the beginning of wisdom was in doubt, not in authority, was a novel doctrine in the world, but Descartes was no armchair philosopher, and his strong advocacy and practice of experimentation had a profound influence in directing men to "la nouvelle methode." He brought the human body, the earthly machine, as he calls it, into the sphere of mechanics and physics, and he wrote the first text-book of physiology, "De l'Homme." Locke, too, became the spokesman of the new questioning spirit, and before the close of the seventeenth century, experimental research became all the mode. Richard Lower, Hooke and Hales were probably more influenced by Descartes than by Harvey, and they made notable contributions to

experimental physiology in England. Borelli, author of the famous work on "The Motion of Animals" (Rome, 1680-1681), brought to the study of the action of muscles a profound knowledge of physics and mathematics and really founded the mechanical, or iatromechanical school. The literature and the language of medicine became that of physics and mechanics: wheels and pulleys, wedges, levers, screws, cords, canals, cisterns, sieves and strainers, with angles, cylinders, celerity, percussion and resistance, were among the words that now came into use in medical literature. Withington quotes a good example in a description by Pitcairne, the Scot who was professor of medicine at Leyden at the end of the seventeenth century. "Life is the circulation of the blood. Health is its free and painless circulation. Disease is an abnormal motion of the blood, either general or local. Like the English school generally, he is far more exclusively mechanical than are the Italians, and will hear nothing of ferments or acids, even in digestion. This, he declares, is a purely mechanical process due to heat and pressure, the wonderful effects of which may be seen in Papin's recently invented digester.' That the stomach is fully able to comminute the food may be proved by the following calculation. Borelli estimates the power of the flexors of the thumb at 3720 pounds, their average weight being 122 grains. Now, the average weight of the stomach is eight ounces, therefore it can develop a force of 117,088 pounds, and this may be further assisted by the diaphragm and abdominal muscles the power of which, estimated in the same way, equals 461,219 pounds! Well may Pitcairne add that this force is not inferior to that of any millstone." Paracelsus gave an extraordinary stimulus to the study of chemistry and more than anyone else he put the old alchemy on modern lines. I have already quoted his sane remark that its chief service is in seeking remedies. But there is another side to this question. If, as seems fairly certain, the Basil Valentine whose writings were supposed to have inspired Paracelsus was a hoax and his works were made up in great part from the writings of Paracelsus, then to our medical Luther, and not to the mythical Benedictine monk, must be attributed a great revival in the search for the Philosopher's Stone, for the Elixir of Life, for a universal medicine, for the perpetuum mobile and for an aurum potabile. I reproduce, almost at random, a page from the fifth and last part of the last will and testament of Basil Valentine (London, 1657), from which you may judge the chemical spirit of the time.

Out of the mystic doctrines of Paracelsus arose the famous "Brothers of the Rosy Cross." "The brotherhood was possessed of the deepest knowledge and science, the transmutation of metals, the perpetuum mobile and the universal medicine were among their secrets; they were free from sickness and suffering during their lifetime, though subject finally to death."

A school of a more rational kind followed directly upon the work of Paracelsus, in which the first man of any importance was Van Helmont. The Paracelsian Archeus was the presiding spirit in living creatures, and worked through special local ferments, by which the functions of the organs are controlled. Disease of any part represents a strike on the part of the local Archeus, who refuses to work. Though full of fanciful ideas, Van Helmont had the experimental spirit and was the first chemist to discover the diversity of

gases. Like his teacher, he was in revolt against the faculty, and he has bitter things to say of physicians. He got into trouble with the Church about the magnetic cure of wounds, as no fewer than twenty-seven propositions incompatible with the Catholic faith were found in his pamphlet (Ferguson). The Philosophus per ignem, Toparcha in Merode, Royenborch, as he is styled in certain of his writings, is not an easy man to tackle. I show the title-page of the "Ortus Medicinae," the collection of his works by his son. As with the pages of Paracelsus, there are many gems to be dug out. The counterblast against bleeding was a useful protest, and to deny in toto its utility in fever required couragea quality never lacking in the Father of Modern Chemistry, as he has been called.

A man of a very different type, a learned academic, a professor of European renown, was Daniel Sennert of Wittenberg, the first to introduce the systematic teaching of chemistry into the curriculum, and who tried to harmonize the Galenists and Paracelsians. Franciscus Sylvius, a disciple of Van Helmont, established the first chemical laboratory in Europe at Leyden, and to him is due the introduction of modern clinical teaching. In 1664 he writes: "I have led my pupils by the hand to medical practice, using a method unknown at Leyden, or perhaps elsewhere, i.e., taking them daily to visit the sick at the public hospital. There I have put the symptoms of disease before their eyes; have let them hear the complaints of the patients, and have asked them their opinions as to the causes and rational treatment of each case, and the reasons for those opinions. Then I have given my own judgment on every point. Together with me they have seen the happy results of treatment when God has granted to our cares a restoration of health; or they have assisted in examining the body when the patient has paid the inevitable tribute to death."

Glauber, Willis, Mayow, Lemery, Agricola and Stahl led up to Robert Boyle, with whom modern chemistry may be said to begin. Even as late as 1716, Lady Mary Wortley Montagu in Vienna found that all had transferred their superstitions from religion to chemistry; "scarcely a man of opulence or fashion that has not an alchemist in his service." To one scientific man of the period I must refer as the author of the first scientific book published in England. Dryden sings:

> Gilbert shall live till load-stones cease to draw
> Or British fleets the boundless ocean awe.

And the verse is true, for by the publication in 1600 of the "De Magnete" the science of electricity was founded. William Gilbert was a fine type of the sixteenth-century physician, a Colchester man, educated at St. John's College, Cambridge. Silvanus Thompson says: "He is beyond question rightfully regarded as the Father of Electric Science. He founded the entire subject of Terrestrial Magnetism. He also made notable contributions to Astronomy, being the earliest English expounder of Copernicus. In an age given over to metaphysical obscurities and dogmatic sophistry, he cultivated the method of experiment and of reasoning from observation, with an insight and success which entitles him to be regarded as the father of the inductive method. That method, so often accredited to Bacon, Gilbert was practicing years before him."

CHAPTER V THE RISE AND DEVELOPMENT OF MODERN MEDICINE

THE middle of the seventeenth century saw the profession thus far on its way—certain objective features of disease were known, the art of careful observation had been cultivated, many empirical remedies had been discovered, the coarser structure of man's body had been well worked out, and a good beginning had been made in the knowledge of how the machinery worked nothing more. What disease really was, where it was, how it was caused, had not even begun to be discussed intelligently.

An empirical discovery of the first importance marks the middle of the century. The story of cinchona is of special interest, as it was the first great specific in disease to be discovered. In 1638, the wife of the Viceroy of Peru, the Countess of Chinchon, lay sick of an intermittent fever in the Palace of Lima. A friend of her husband's, who had become acquainted with the virtues, in fever, of the bark of a certain tree, sent a parcel of it to the Viceroy, and the remedy administered by her physician, Don Juan del Vego, rapidly effected a cure. In 1640, the Countess returned to Spain, bringing with her a supply of quina bark, which thus became known in Europe as "the Countess's Powder" (pulvis Comitissae). A little later, her doctor followed, bringing additional quantities. Later in the century, the Jesuit Fathers sent parcels of the bark to Rome, whence it was distributed to the priests of the community and used for the cure of ague; hence the name of "Jesuits' bark." Its value was early recognized by Sydenham and by Locke. At first there was a great deal of opposition, and the Protestants did not like it because of its introduction by the Jesuits. The famous quack, Robert Talbor, sold the secret of preparing quinquina to Louis XIV in 1679 for two thousand louis d'or, a pension and a title. That the profession was divided in opinion on the subject was probably due to sophistication, or to the importation of other and inert barks. It was well into the eighteenth century before its virtues were universally acknowledged. The tree itself was not described until 1738, and Linnaeus established the genus "Chinchona" in honor of the Countess.

A step in advance followed the objective study of the changes wrought in the body by disease. To a few of these the anatomists had already called attention. Vesalius, always keen in his description of aberrations from the normal, was one of the first to describe internal aneurysm. The truth is, even the best of men had little or no appreciation of the importance of the study of these changes. Sydenham scoffs at the value of post-mortems.

Again we have to go back to Italy for the beginning of these studies, this time to Florence, in the glorious days of Lorenzo the Magnificent. The pioneer now is not a professor but a general practitioner, Antonio Benivieni, of whom we know very little save that he was a friend of Marsilio Ficino and of Angelo Poliziano, and that he practiced in Florence during the last third of the fifteenth century, dying in 1502. Through associations with the scholars of the day, he had become a student of Greek medicine and he was not only a shrewd and accurate observer of nature but a bold

and successful practitioner. He had formed the good habit of making brief notes of his more important cases, and after his death these were found by his brother Jerome and published in 1507. This book has a rare value as the record of the experience of an unusually intelligent practitioner of the period. There are in all 111 observations, most of them commendably brief. The only one of any length deals with the new "Morbus Gallicus," of which, in the short period between its appearance and Benivieni's death, he had seen enough to leave a very accurate description; and it is interesting to note that even in those early days mercury was employed for its cure. The surgical cases are of exceptional interest, and No. 38 refers to a case of angina for which he performed a successful operation. This is supposed to have been a tracheotomy, and if so, it is the first in the fourteen centuries that had elapsed since the days of Antyllus. There are other important cases which show that he was a dexterous and fearless surgeon. But the special interest of the work for us is that, for the first time in modern literature, we have reports of post-mortem examinations made specifically with a view to finding out the exact cause of death. Among the 111 cases, there are post-mortem records of cases of gallstones, abscess of the mesentery, thrombosis of the mesenteric veins, several cases of heart disease, senile gangrene and one of cor villosum. From no other book do we get so good an idea of a practitioner's experience at this period; the notes are plain and straightforward, and singularly free from all theoretical and therapeutic vagaries. He gives several remarkable instances of faith healing.

To know accurately the anatomical changes that take place in disease is of importance both for diagnosis and for treatment. The man who created the science, who taught us to think anatomically of disease, was Morgagni, whose "De sedibus et causis morborum per anatomen indagatis" is one of the great books in our literature. During the seventeenth century, the practice of making post-mortem examinations had extended greatly, and in the "Sepulchretum anatomicum" of Bonetus (1679), these scattered fragments are collected. But the work of Morgagni is of a different type, for in it are the clinical and anatomical observations of an able physician during a long and active life. The work had an interesting origin. A young friend interested in science and in medicine was fond of discoursing with Morgagni about his preceptors, particularly Valsalva and Albertini, and sometimes the young man inquired about Morgagni's own observations and thoughts. Yielding to a strong wish, Morgagni consented to write his young friend familiar letters describing his experiences. I am sorry that Morgagni does not mention the name of the man to whom we are so much indebted, and who, he states, was so pleased with the letters that he continually solicited him to send more and more "till he drew me on so far as the seventieth; . . . when I begged them of him in order to revise their contents; he did not return them, till he had made me solemnly promise, that I would not abridge any part thereof" (Preface).

Born in 1682, Morgagni studied at Bologna under Valsalva and Albertini. In 1711, he was elected professor of medicine at Padua. He published numerous anatomical observations and several smaller works of less importance. The great work which has made his name immortal in the profession, appeared in his eightieth year, and represents

the accumulated experience of a long life. Though written in the form of letters, the work is arranged systematically and has an index of exceptional value. From no section does one get a better idea of the character and scope of the work than from that relating to the heart and arteries affections of the pericardium, diseases of the valves, ulceration, rupture, dilation and hypertrophy and affections of the aorta are very fully described. The section on aneurysm of the aorta remains one of the best ever written. It is not the anatomical observations alone that make the work of unusual value, but the combination of clinical with anatomical records. What could be more correct than this account of angina pectoris probably the first in the literature? "A lady forty-two years of age, who for a long time, had been a valetudinarian, and within the same period, on using pretty quick exercise of body, she was subject to attacks of violent anguish in the upper part of the chest on the left side, accompanied with a difficulty of breathing, and numbness of the left arm; but these paroxysms soon subsided when she ceased from exertion. In these circumstances, but with cheerfulness of mind, she undertook a journey from Venice, purposing to travel along the continent, when she was seized with a paroxysm, and died on the spot. I examined the body on the following day . . . The aorta was considerably dilated at its curvature; and, in places, through its whole tract, the inner surface was unequal and ossified. These appearances were propagated into the arteria innominata. The aortic valves were indurated . . ." He remarks, "The delay of blood in the aorta, in the heart, in the pulmonary vessels, and in the vena cave, would occasion the symptoms of which the woman complained during life; namely, the violent uneasiness, the difficulty of breathing, and the numbness of the arm."

Morgagni's life had as much influence as his work. In close correspondence with the leading men of the day, with the young and rising teachers and workers, his methods must have been a great inspiration; and he came just at the right time. The profession was literally ravaged by theories, schools and systems iatromechanics, iatrochemistry, humoralism, the animism of Stahl, the vitalistic doctrines of Van Helmont and his followers— and into this metaphysical confusion Morgagni came like an old Greek with his clear observation, sensible thinking and ripe scholarship. Sprengel well remarks that "it is hard to say whether one should admire most his rare dexterity and quickness in dissection, his unimpeachable love of truth and justice in his estimation of the work of others, his extensive scholarship and rich classical style or his downright common sense and manly speech."

Upon this solid foundation the morbid anatomy of modern clinical medicine was built. Many of Morgagni's contemporaries did not fully appreciate the change that was in progress, and the value of the new method of correlating the clinical symptoms and the morbid appearances. After all, it was only the extension of the Hippocratic method of careful observation—the study of facts from which reasonable conclusions could be drawn. In every generation there had been men of this type I dare say many more than we realize men of the Benivieni character, thoroughly practical, clear-headed physicians. A model of this sort arose in England in the middle of the seventeenth century, Thomas Sydenham (1624-1689), who took men back to Hippocrates, just as Harvey had led them

back to Galen. Sydenham broke with authority and went to nature. It is extraordinary how he could have been so emancipated from dogmas and theories of all sorts. He laid down the fundamental proposition, and acted upon it, that "all disease could be described as natural history." To do him justice we must remember, as Dr. John Brown says, "in the midst of what a mass of errors and prejudices, of theories actively mischievous, he was placed, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums" ("Horae Subsecivae," Vol. I, 4th ed., Edinburgh, 1882, p. 40).

Listen to what he says upon the method of the study of medicine: "In writing therefore, such a natural history of diseases, every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The usefulness of this procedure cannot be easily overrated, as compared with the subtle inquiries and trifling notions of modern writers, for can there be a shorter, or indeed any other way of coming at the morbific causes, or discovering the curative indications than by a certain perception of the peculiar symptoms? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of nature. He found that nature alone often terminates diseases, and works a cure with a few simple medicines, and often enough with no medicines at all."

Towards the end of the century many great clinical teachers arose, of whom perhaps the most famous was Boerhaave, often spoken of as the Dutch Hippocrates, who inspired a group of distinguished students. I have already referred to the fact that Franciscus Sylvius at Leyden was the first among the moderns to organize systematic clinical teaching. Under Boerhaave, this was so developed that to this Dutch university students flocked from all parts of Europe. After teaching botany and chemistry, Boerhaave succeeded to the chair of physic in 1714. With an unusually wide general training, a profound knowledge of the chemistry of the day and an accurate acquaintance with all aspects of the history of the profession, he had a strongly objective attitude of mind towards disease, following closely the methods of Hippocrates and Sydenham. He adopted no special system, but studied disease as one of the phenomena of nature. His clinical lectures, held bi-weekly, became exceedingly popular and were made attractive not less by the accuracy and care with which the cases were studied than by the freedom from fanciful doctrines and the frank honesty of the man. He was much greater than his published work would indicate, and, as is the case with many teachers of the first rank, his greatest contributions were his pupils. No other teacher of modern times has had such a following. Among his favorite pupils may be mentioned Haller, the physiologist, and van Swieten and de Haen, the founders of the Vienna school.

In Italy, too, there were men who caught the new spirit, and appreciated the value of combining morbid anatomy with clinical medicine. Lancisi, one of the early students of disease of the heart, left an excellent monograph on the subject, and was the first to call special attention to the association of syphilis with cardio-vascular disease. A younger contemporary of his at Rome, Baglivi, was unceasing in his call to the profession to

return to Hippocratic methods, to stop reading philosophical theories and to give up what he calls the "fatal itch" to make systems.

The Leyden methods of instruction were carried far and wide throughout Europe; into Edinburgh by John Rutherford, who began to teach at the Royal Infirmary in 1747, and was followed by Whytt and by Cullen; into England by William Saunders of Guy's Hospital. Unfortunately the great majority of clinicians could not get away from the theoretical conceptions of disease, and Cullen's theory of spasm and atony exercised a profound influence on practice, particularly in this country, where it had the warm advocacy of Benjamin Rush. Even more widespread became the theories of a pupil of Cullen's, John Brown, who regarded excitability as the fundamental property of all living creatures: too much of this excitability produced what were known as sthenic maladies, too little, asthenic; on which principles practice was plain enough. Few systems of medicine have ever stirred such bitter controversy, particularly on the Continent, and in Charles Creighton's account of Brown we read that as late as 1802 the University of Gottingen was so convulsed by controversies as to the merits of the Brunonian system that contending factions of students in enormous numbers, not unaided by the professors, met in combat in the streets on two consecutive days and had to be dispersed by a troop of Hanoverian horse.

But the man who combined the qualities of Vesalius, Harvey and Morgagni in an extraordinary personality was John Hunter. He was, in the first place, a naturalist to whom pathological processes were only a small part of a stupendous whole, governed by law, which, however, could never be understood until the facts had been accumulated, tabulated and systematized. By his example, by his prodigious industry, and by his suggestive experiments he led men again into the old paths of Aristotle, Galen and Harvey. He made all thinking physicians naturalists, and he lent a dignity to the study of organic life, and re-established a close union between medicine and the natural sciences. Both in Britain and Greater Britain, he laid the foundation of the great collections and museums, particularly those connected with the medical schools. The Wistar-Horner and the Warren Museums in this country originated with men greatly influenced by Hunter. He was, moreover, the intellectual father of that interesting group of men on this side of the Atlantic who, while practising as physicians, devoted much time and labor to the study of natural history; such men as Benjamin Smith Barton, David Hossack, Jacob Bigelow, Richard Harlan, John D. Godman, Samuel George Morton, John Collins Warren, Samuel L. Mitchill and J. Ailken Meigs. He gave an immense impetus in Great Britain to the study of morbid anatomy, and his nephew, Matthew Baillie, published the first important book on the subject in the English language.

Before the eighteenth century closed practical medicine had made great advance. Smallpox, though not one of the great scourges like plague or cholera, was a prevalent and much dreaded disease, and in civilized countries few reached adult life without an attack. Edward Jenner, a practitioner in Gloucestershire, and the pupil to whom John Hunter gave the famous advice: "Don't think, try!" had noticed that milkmaids who had been infected with cowpox from the udder of the cow were insusceptible to smallpox.

I show you here the hand of Sarah Nelmes with cowpox, 1796. A vague notion had prevailed among the dairies from time immemorial that this disease was a preventive of the smallpox. Jenner put the matter to the test of experiment. Let me quote here his own words: "The first experiment was made upon a lad of the name of Phipps, in whose arm a little vaccine virus was inserted, taken from the hand of a young woman who had been accidentally infected by a cow. Notwithstanding the resemblance which the pustule, thus excited on the boy's arm, bore to variolous inoculation, yet as the indisposition attending it was barely perceptible, I could scarcely persuade myself the patient was secure from the Small Pox. However, on his being inoculated some months afterwards, it proved that he was secure." The results of his experiments were published in a famous small quarto volume in 1798.(*) From this date, smallpox has been under control. Thanks to Jenner, not a single person in this audience is pockmarked! A hundred and twenty-five years ago, the faces of more than half of you would have been scarred. We now know the principle upon which protection is secured: an active acquired immunity follows upon an attack of a disease of a similar nature. Smallpox and cowpox are closely allied and the substances formed in the blood by the one are resistant to the virus of the other. I do not see how any reasonable person can oppose vaccination or decry its benefits. I show you the mortality figures of the Prussian Army and of the German Empire. A comparison with the statistics of the armies of other European countries in which revaccination is not so thoroughly carried out is most convincing of its efficacy.

The early years of the century saw the rise of modern clinical medicine in Paris. In the art of observation men had come to a standstill. I doubt very much whether Corvisart in 1800 was any more skilful in recognizing a case of pneumonia than was Aretaeus in the second century A. D. But disease had come to be more systematically studied; special clinics were organized, and teaching became much more thorough. Anyone who wishes to have a picture of the medical schools in Europe in the first few years of the century, should read the account of the travels of Joseph Frank of Vienna. The description of Corvisart is of a pioneer in clinical teaching whose method remains in vogue today in France the ward visit, followed by a systematic lecture in the amphitheatre. There were still lectures on Hippocrates three times a week, and bleeding was the principal plan of treatment: one morning Frank saw thirty patients, out of one hundred and twelve, bled! Corvisart was the strong clinician of his generation, and his accurate studies on the heart were among the first that had concentrated attention upon a special organ. To him, too, is due the reintroduction of the art of percussion in internal disease discovered by Auenbrugger in 1761.

The man who gave the greatest impetus to the study of scientific medicine at this time was Bichat, who pointed out that the pathological changes in disease were not so much in organs as in tissues. His studies laid the foundation of modern histology. He separated the chief constituent elements of the body into various tissues possessing definite physical and vital qualities. "Sensibility and contractability are the fundamental qualities of living matter and of the life of our tissues. Thus Bichat substituted for vital forces vital properties,' that is to say, a series of vital forces inherent in the different

tissues." His "Anatomic Generale," published in 1802, gave an extraordinary stimulus to the study of the finer processes of disease, and his famous "Recherches sur la Vie et sur la Mort" (1800) dealt a death-blow to old iatromechanical and iatrochemical views. His celebrated definition may be quoted: "La vie est l'ensemble des proprietes vitales qui resistent aux proprietes physiques, ou bien la vie est l'ensemble des fonctions qui resistent a la mort." (Life is the sum of the vital properties that withstand the physical properties, or, life is the sum of the functions that withstand death.) Bichat is another pathetic figure in medical history. His meteoric career ended in his thirty-first year: he died a victim of a post-mortem wound infection. At his death, Corvisart wrote Napoleon: "Bichat has just died at the age of thirty. That battlefield on which he fell is one which demands courage and claims many victims. He has advanced the science of medicine. No one at his age has done so much so well."

It was a pupil of Corvisart, Rene Théophile Laënnec, who laid the foundation of modern clinical medicine. The story of his life is well known. A Breton by birth, he had a hard, up-hill struggle as a young man a struggle of which we have only recently been made aware by the publication of a charming book by Professor Rouxeau of Nantes—" Laënnec avant 1806." Influenced by Corvisart, he began to combine the accurate study of cases in the wards with anatomical investigations in the dead-house. Before Laënnec, the examination of a patient had been largely by sense of sight, supplemented by that of touch, as in estimating the degree of fever, or the character of the pulse. Auenbrugger's "Inventum novum" of percussion, recognized by Corvisart, extended the field; but the discovery of auscultation by Laënnec, and the publication of his work" De l'Auscultation Mediate," 1819, marked an era in the study of medicine. The clinical recognition of individual diseases had made really very little progress; with the stethoscope begins the day of physical diagnosis. The clinical pathology of the heart, lungs and abdomen was revolutionized. Laënnec's book is in the category of the eight or ten greatest contributions to the science of medicine.(*) His description of tuberculosis is perhaps the most masterly chapter in clinical medicine. This revolution was effected by a simple extension of the Hippocratic method from the bed to the dead-house, and by correlating the signs and symptoms of a disease with its anatomical appearances.

The pupils and successors of Corvisart Bayle, Andral, Bouillaud, Chomel, Piorry, Bretonneau, Rayer, Cruveilhier and Trousseau brought a new spirit into the profession. Everywhere the investigation of disease by clinical-pathological methods widened enormously the diagnostic powers of the physician. By this method Richard Bright, in 1836, opened a new chapter on the relation of disease of the kidney to dropsy, and to albuminous urine. It had already been shown by Blackwell and by Wells, the celebrated Charleston (S.C.) physician, in 1811, that the urine contained albumin in many cases of dropsy, but it was not until Bright began a careful investigation of the bodies of patients who had presented these symptoms, that he discovered the association of various forms of disease of the kidney with anasarca and albuminous urine. In no direction was the harvest of this combined study more abundant than in the complicated and confused subject of fever. The work of Louis and of his pupils, W.W. Gerhard and others, revealed

the distinction between typhus and typhoid fever, and so cleared up one of the most obscure problems in pathology. By Morgagni's method of "anatomical thinking," Skoda in Vienna, Schonlein in Berlin, Graves and Stokes in Dublin, Marshall Hall, C. J. B. Williams and many others introduced the new and exact methods of the French and created a new clinical medicine. A very strong impetus was given by the researches of Virchow on cellular pathology, which removed the seats of disease from the tissues, as taught by Bichat, to the individual elements, the cells. The introduction of the use of the microscope in clinical work widened greatly our powers of diagnosis, and we obtained thereby a very much clearer conception of the actual processes of disease. In another way, too, medicine was greatly helped by the rise of experimental pathology, which had been introduced by John Hunter, was carried along by Magendie and others, and reached its culmination in the epoch-making researches of Claude Bernard. Not only were valuable studies made on the action of drugs, but also our knowledge of cardiac pathology was revolutionized by the work of Traube, Cohnheim and others. In no direction did the experimental method effect such a revolution as in our knowledge of the functions of the brain. Clinical neurology, which had received a great impetus by the studies of Todd, Romberg, Lockhart Clarke, Duchenne and Weir Mitchell, was completely revolutionized by the experimental work of Hitzig, Fritsch and Ferrier on the localization of functions in the brain. Under Charcot, the school of French neurologists gave great accuracy to the diagnosis of obscure affections of the brain and spinal cord, and the combined results of the new anatomical, physiological and experimental work have rendered clear and definite what was formerly the most obscure and complicated section of internal medicine. The end of the fifth decade of the century is marked by a discovery of supreme importance. Humphry Davy had noted the effects of nitrous oxide. The exhilarating influence of sulphuric ether had been casually studied, and Long of Georgia had made patients inhale the vapor until anaesthetic and had performed operations upon them when in this state; but it was not until October 16, 1846, in the Massachusetts General Hospital, that Morton, in a public operating room, rendered a patient insensible with ether and demonstrated the utility of surgical anaesthesia. The rival claims of priority no longer interest us, but the occasion is one of the most memorable in the history of the race. It is well that our colleagues celebrate Ether Day in Boston— no more precious boon has ever been granted to suffering humanity.(*)

In 1857, a young man, Louis Pasteur, sent to the Lille Scientific Society a paper on "Lactic Acid Fermentation" and in December of the same year presented to the Academy of Sciences in Paris a paper on "Alcoholic Fermentation" in which he concluded that "the deduplication of sugar into alcohol and carbonic acid is correlative to a phenomenon of life." A new era in medicine dates from those two publications. The story of Pasteur's life should be read by every student.(*) It is one of the glories of human literature, and, as a record of achievement and of nobility of character, is almost without an equal.

At the middle of the last century we did not know much more of the actual causes of the great scourges of the race, the plagues, the fevers and the pestilences, than did the Greeks. Here comes Pasteur's great work. Before him Egyptian darkness; with his

advent a light that brightens more and more as the years give us ever fuller knowledge. The facts that fevers were catching, that epidemics spread, that infection could remain attached to articles of clothing, etc., all gave support to the view that the actual cause was something alive, a contagium vivum. It was really a very old view, the germs of which may be found in the Fathers, but which was first clearly expressed—so far as I know by Fracastorius, the Veronese physician, in the sixteenth century, who spoke of the seeds of contagion passing from one person to another; and he first drew a parallel between the processes of contagion and the fermentation of wine. This was more than one hundred years before Kircher, Leeuwenhoek and others began to use the microscope and to see animalcula, etc., in water, and so give a basis for the "infinitely little" view of the nature of disease germs. And it was a study of the processes of fermentation that led Pasteur to the sure ground on which we now stand.

Out of these researches arose a famous battle which kept Pasteur hard at work for four or five years the struggle over spontaneous generation. It was an old warfare, but the microscope had revealed a new world, and the experiments on fermentation had lent great weight to the omne vivum ex ovo doctrine. The famous Italians, Redi and Spallanzani, had led the way in their experiments, and the latter had reached the conclusion that there is no vegetable and no animal that has not its own germ. But heterogenesis became the burning question, and Pouchet in France, and Bastian in England, led the opposition to Pasteur. The many famous experiments carried conviction to the minds of scientific men, and destroyed forever the old belief in spontaneous generation. All along, the analogy between disease and fermentation must have been in Pasteur's mind; and then came the suggestion, "What would be most desirable is to push those studies far enough to prepare the road for a serious research into the origin of various diseases." If the changes in lactic, alcoholic and butyric fermentations are due to minute living organisms, why should not the same tiny creatures make the changes which occur in the body in the putrid and suppurative diseases? With an accurate training as a chemist, having been diverted in his studies upon fermentation into the realm of biology, and nourishing a strong conviction of the identity between putrefactive changes of the body and fermentation, Pasteur was well prepared to undertake investigations which had hitherto been confined to physicians alone.

So impressed was he with the analogy between fermentation and the infectious diseases that, in 1863, he assured the French Emperor of his ambition "to arrive at the knowledge of the causes of putrid and contagious diseases." After a study upon the diseases of wines, which has had most important practical bearings, an opportunity arose which changed the whole course of his career, and profoundly influenced the development of medical science. A disease of the silkworm had, for some years, ruined one of the most important industries in France, and in 1865 the Government asked Pasteur to give up his laboratory work and teaching, and to devote his whole energies to the task of investigating it. The story of the brilliant success which followed years of application to the problem will be read with deep interest by every student of science. It was the first of his victories in the application of the experimental methods of a trained

chemist to the problems of biology, and it placed his name high in the group of the most illustrious benefactors of practical industries.

In a series of studies on the diseases of beer, and on the mode of production of vinegar, he became more and more convinced that these studies on fermentation had given him the key to the nature of the infectious diseases. It is a remarkable fact that the distinguished English philosopher of the seventeenth century, the man who more than anyone else of his century appreciated the importance of the experimental method, Robert Boyle, had said that he who could discover the nature of ferments and fermentation, would be more capable than anyone else of explaining the nature of certain diseases.

In 1876 there appeared in Cohn's "Beitrage zur Morphologie der Pflanzen" (II, 277-310), a paper on the "AEtiology of Anthrax" by a German district physician in Wollstein, Robert Koch, which is memorable in our literature as the starting point of a new method of research into the causation of infectious diseases. Koch demonstrated the constant presence of germs in the blood of animals dying from the disease. Years before, those organisms had been seen by Pollender and Davaine, but the epoch-making advance of Koch was to grow those organisms in a pure culture outside the body, and to produce the disease artificially by inoculating animals with the cultures Koch is really our medical Galileo, who, by means of a new technique, pure cultures and isolated staining introduced us to a new world. In 1878, followed his study on the "AEtiology of Wound Infections," in which he was able to demonstrate conclusively the association of micro-organisms with the disease. Upon those two memorable researches made by a country doctor rests the modern science of bacteriology.

The next great advance was the discovery by Pasteur of the possibility of so attenuating, or weakening, the poison that an animal inoculated had a slight attack, recovered and was then protected against the disease. More than eighty years had passed since on May 14, 1796, Jenner had vaccinated a child with cowpox and proved that a slight attack of one disease protected the body from a disease of an allied nature. An occasion equally famous in the history of medicine was a day in 1881, when Pasteur determined that a flock of sheep vaccinated with the attenuated virus of anthrax remained well, when every one of the unvaccinated infected from the same material had died. Meanwhile, from Pasteur's researches on fermentation and spontaneous generation, a transformation had been initiated in the practice of surgery, which, it is not too much to say, has proved one of the greatest boons ever conferred upon humanity. It had long been recognized that, now and again, a wound healed without the formation of pus, that is, without suppuration, but both spontaneous and operative wounds were almost invariably associated with that process; and, moreover, they frequently became putrid, as it was then called,—infected, as we should say, the general system became involved and the patient died of blood poisoning. So common was this, particularly in old, ill-equipped hospitals, that many surgeons feared to operate, and the general mortality in all surgical cases was very high. Believing that it was from outside that the germs came which caused the decomposition of wounds, just as from the atmosphere the sugar solution got the germs which caused the fermentation, a young surgeon in Glasgow,

Joseph Lister, applied the principles of Pasteur's experiments to their treatment. From Lister's original paper(*) I quote the following: "Turning now to the question how the atmosphere produces decomposition of organic substances, we find that a flood of light has been thrown upon this most important subject by the philosophic researches of M. Pasteur, who has demonstrated by thoroughly convincing evidence that it is not to its oxygen or to any of its gaseous constituents that the air owes this property, but to minute particles suspended in it, which are the germs of various low forms of life, long since revealed by the microscope, and regarded as merely accidental concomitants of putrescence, but now shown by Pasteur to be its essential cause, resolving the complex organic compounds into substances of simpler chemical constitution, just as the yeast-plant converts sugar into alcohol and carbonic acid." From these beginnings modern surgery took its rise, and the whole subject of wound infection, not only in relation to surgical diseases, but to child-bed fever, forms now one of the most brilliant chapters in the history of preventive medicine.

With the new technique and experimental methods, the discovery of the specific germs of many of the more important acute infections followed each other with bewildering rapidity: typhoid fever, diphtheria, cholera, tetanus, plague, pneumonia, gonorrhoea and, most important of all, tuberculosis. It is not too much to say that the demonstration by Koch of the "bacillus tuberculosis" (1882) is, in its far-reaching results, one of the most momentous discoveries ever made.

Of almost equal value have been the researches upon the protozoan forms of animal life, as causes of disease. As early as 1873, spirilla were demonstrated in relapsing fever. Laveran proved the association of haematozoa with malaria in 1880. In the same year, Griffith Evans discovered trypanosomes in a disease of horses and cattle in India, and the same type of parasite was found in the sleeping sickness. Amoebae were demonstrated in one form of dysentery, and in other tropical diseases protozoa were discovered, so that we were really prepared for the announcement in 1905, by Schaudinn, of the discovery of a protozoan parasite in syphilis. Just fifty years had passed since Pasteur had sent in his paper on "Lactic Acid Fermentation" to the Lille Scientific Society— half a century in which more had been done to determine the true nature of disease than in all the time that had passed since Hippocrates. Celsus makes the oft-quoted remark that to determine the cause of a disease often leads to the remedy,(*) and it is the possibility of removing the cause that gives such importance to the new researches on disease.

(*) "Et causae quoque estimatio saepe morbum solvit," Celsus, Lib. I, Prefatio.—Ed.

INTERNAL SECRETIONS

ONE of the greatest contributions of the nineteenth century to scientific medicine was the discovery of the internal secretions of organs. The basic work on the subject was done by Claude Bernard, a pupil of the great Magendie, whose saying it is well to

remember" When entering a laboratory one should leave theories in the cloakroom." More than any other man of his generation, Claude Bernard appreciated the importance of experiment in practical medicine. For him the experimental physician was the physician of the future a view well borne out by the influence his epoch-making work has had on the treatment of disease. His studies on the glycogenic functions of the liver opened the way for the modern fruitful researches on the internal secretions of the various glands. About the same time that Bernard was developing the laboratory side of the problem, Addison, a physician to Guy's Hospital, in 1855, pointed out the relation of a remarkable group of symptoms to disease of the suprarenal glands, small bodies situated above the kidneys, the importance of which had not been previously recognized. With the loss of the function of these glands by disease, the body was deprived of something formed by them which was essential to its proper working. Then, in the last third of the century, came in rapid succession the demonstration of the relations of the pancreas to diabetes, of the vital importance of the thyroid gland and of the pituitary body. Perhaps no more striking illustration of the value of experimental medicine has ever been given than that afforded by the studies upon those glands.

The thyroid body, situated in the neck and the enlargement of which is called goitre, secretes substances which pass into the blood, and which are necessary for the growth of the body in childhood, for the development of the mind and for the nutrition of the tissues of the skin. If, following an infectious disease, a child has wasting of this gland, or if, living in a certain district, it has a large goitre, normal development does not take place, and the child does not grow in mind or body and becomes what is called a cretin. More than this—if in adult life the gland is completely removed, or if it wastes, a somewhat similar condition is produced, and the patient in time loses his mental powers and becomes fat and flabby myxedematous. It has been shown experimentally in various ways that the necessary elements of the secretion can be furnished by feeding with the gland or its extracts, and that the cretinoid or myxedematous conditions could thus be cured or prevented.

Experimental work has also demonstrated the functions of the suprarenal glands and explained the symptoms of Addison's disease, and chemists have even succeeded in making synthetically the active principle adrenalin.

There is perhaps no more fascinating story in the history of science than that of the discovery of these so-called ductless glands. Part of its special interest is due to the fact that clinicians, surgeons, experimental physiologists, pathologists and chemists have all combined in splendid teamwork to win the victory. No such miracles have ever before been wrought by physicians as those which we see in connection with the internal secretion of the thyroid gland. The myth of bringing the dead back to life has been associated with the names of many great healers since the incident of Empedocles and Pantheia, but nowadays the dead in mind and the deformed in body may be restored by the touch of the magic wand of science. The study of the interaction of these internal secretions, their influence upon development, upon mental process and upon disorders of metabolism is likely to prove in the future of a benefit scarcely less remarkable than that which we have traced in the infectious diseases.

CHEMISTRY

IT is not making too strong a statement to say that the chemistry and chemical physics of the nineteenth century have revolutionized the world. It is difficult to realize that Liebig's famous Giessen laboratory, the first to be opened to students for practical study, was founded in the year 1825. Boyle, Cavendish, Priestley, Lavoisier, Black, Dalton and others had laid a broad foundation, and Young, Frauenhofer, Rumford, Davy, Joule, Faraday, Clerk-Maxwell, Helmholtz and others built upon that and gave us the new physics and made possible our age of electricity. New technique and new methods have given a powerful stimulus to the study of the chemical changes that take place in the body, which, only a few years ago, were matters largely of speculation. "Now," in the words of Professor Lee, "we recognize that, with its living and its non-living substances inextricably intermingled, the body constitutes an intensive chemical laboratory in which there is ever occurring a vast congeries of chemical reactions; both constructive and destructive processes go on; new protoplasm takes the place of old. We can analyze the income of the body and we can analyze its output, and from these data we can learn much concerning the body's chemistry. A great improvement in the method of such work has recently been secured by the device of inclosing the person who is the subject of the experiment in a respiration calorimeter. This is an air-tight chamber, artificially supplied with a constant stream of pure air, and from which the expired air, laden with the products of respiration, is withdrawn for purposes of analysis. The subject may remain in the chamber for days, the composition of all food and all excrete being determined, and all heat that is given off being measured. Favorable conditions are thus established for an exact study of many problems of nutrition. The difficulties increase when we attempt to trace the successive steps in the corporeal pathway of molecule and atom. Yet these secrets of the vital process are also gradually being revealed. When we remember that it is in this very field of nutrition that there exist great popular ignorance and a special proneness to fad and prejudice, we realize how practically helpful are such exact studies of metabolism."

CHAPTER VI— THE RISE OF PREVENTIVE MEDICINE

THE story so far has been of men and of movements of men who have, consciously or unconsciously, initiated great movements, and of movements by which, nolens volens, the men of the time were moulded and controlled. Hippocrates, in the tractate on "Ancient Medicine," has a splendid paragraph on the attitude of mind towards the men of the past. My attention was called to it one day in the Roman Forum by Commendatore Boni, who quoted it as one of the great sayings of antiquity. Here it is: "But on that account, I say, we ought not to reject the ancient Art, as if it were not, and had not been properly founded, because it did not attain accuracy in all things, but rather, since it is capable of reaching to the greatest exactitude by reasoning, to receive it and admire its

discoveries, made from a state of great ignorance, and as having been well and properly made, and not from chance."

I have tried to tell you what the best of these men in successive ages knew, to show you their point of outlook on the things that interest us. To understand the old writers one must see as they saw, feel as they felt, believe as they believed and this is hard, indeed impossible! We may get near them by asking the Spirit of the Age in which they lived to enter in and dwell with us, but it does not always come. Literary criticism is not literary history—we have no use here for the former, but to analyze his writings is to get as far as we can behind the doors of a man's mind, to know and appraise his knowledge, not from our standpoint, but from that of his contemporaries, his predecessors and his immediate successors. Each generation has its own problems to face, looks at truth from a special focus and does not see quite the same outlines as any other. For example, men of the present generation grow up under influences very different from those which surrounded my generation in the seventies of the last century, when Virchow and his great contemporaries laid the sure and deep foundations of modern pathology. Which of you now knows the "Cellular Pathology" as we did? To many of you it is a closed book, to many more Virchow may be thought a spent force. But no, he has only taken his place in a great galaxy. We do not forget the magnitude of his labors, but a new generation has new problems—his message was not for you but that medicine today runs in larger moulds and turns out finer castings is due to his life and work. It is one of the values of lectures on the history of medicine to keep alive the good influences of great men even after their positive teaching is antiquated. Let no man be so foolish as to think that he has exhausted any subject for his generation. Virchow was not happy when he saw the young men pour into the old bottle of cellular pathology the new wine of bacteriology. Lister could never understand how aseptic surgery arose out of his work. Ehrlich would not recognize his epoch-making views on immunity when this generation has finished with them. I believe it was Hegel who said that progress is a series of negations—the denial today of what was accepted yesterday, the contradiction by each generation of some part at least of the philosophy of the last; but all is not lost, the germ plasm remains, a nucleus of truth to be fertilized by men often ignorant even of the body from which it has come. Knowledge evolves, but in such a way that its possessors are never in sure possession. "It is because science is sure of nothing that it is always advancing" (Duclaux).

History is the biography of the mind of man, and its educational value is in direct proportion to the completeness of our study of the individuals through whom this mind has been manifested. I have tried to take you back to the beginnings of science, and to trace its gradual development, which is conditioned by three laws. In the first place, like a living organism, truth grows, and its gradual evolution may be traced from the tiny germ to the mature product. Never springing, Minerva-like, to full stature at once, truth may suffer all the hazards incident to generation and gestation. Much of history is a record of the mishaps of truths which have struggled to the birth, only to die or

else to wither in premature decay. Or the germ may be dormant for centuries, awaiting the fullness of time.

Secondly, all scientific truth is conditioned by the state of knowledge at the time of its announcement. Thus, at the beginning of the seventeenth century, the science of optics and mechanical appliances had not made possible (so far as the human mind was concerned) the existence of blood capillaries and blood corpuscles. Jenner could not have added to his "Inquiry" a study on immunity; Sir William Perkin and the chemists made Koch technique possible; Pasteur gave the conditions that produced Lister; Davy and others furnished the preliminaries necessary for anaesthesia. Everywhere we find this filiation, one event following the other in orderly sequence "Mind begets mind," as Harvey (De Generatione) says; "opinion is the source of opinion. Democritus with his atoms, and Eudoxus with his chief good which he placed in pleasure, impregnated Epicurus; the four elements of Empedocles, Aristotle; the doctrines of the ancient Thebans, Pythagoras and Plato; geometry, Euclid."

And, thirdly, to scientific truth alone may the homo mensura principle be applied, since of all mental treasures of the race it alone compels general acquiescence. That this general acquiescence, this aspect of certainty, is not reached per saltum, but is of slow, often of difficult growth, marked by failures and frailties, but crowned at last with an acceptance accorded to no other product of mental activity, is illustrated by every important discovery from Copernicus to Darwin.

The difficulty is to get men to the thinking level which compels the application of scientific truths. Protagoras, that "mighty-wise man," as Socrates called him, who was responsible for the aphorism that man is the measure of all things, would have been the first to recognize the folly of this standard for the people at large. But we have gradually reached a stage in which knowledge is translated into action, made helpful for suffering humanity, just as the great discoveries in physics and chemistry have been made useful in the advance of civilization. We have traced medicine through a series of upward steps a primitive stage, in which it emerged from magic and religion into an empirical art, as seen among the Egyptians and Babylonians; a stage in which the natural character of disease was recognized and the importance of its study as a phenomenon of nature was announced; a stage in which the structure and functions of the human body were worked out; a stage in which the clinical and anatomical features of disease were determined; a stage in which the causes of disorders were profitably studied, and a final stage, into which we have just entered, the application of the knowledge for their prevention. Science has completely changed man's attitude towards disease.

Take a recent concrete illustration. A couple of years ago in Philadelphia and in some other parts of the United States, a very peculiar disease appeared, characterized by a rash upon the skin and moderate fever, and a constitutional disturbance proportionate to the extent and severity of the eruption. The malady first broke out in the members of a crew of a private yacht; then in the crews of other boats, and among persons living in the boarding-houses along the docks. It was the cause of a great deal of suffering and disability.

There were three courses open: to accept the disease as a visitation of God, a chastening affliction sent from above, and to call to aid the spiritual arm of the church. Except the "Peculiar People" few now take this view or adopt this practice. The Christian Scientist would probably deny the existence of the rash and of the fever, refuse to recognize the itching and get himself into harmony with the Infinite. Thirdly, the method of experimental medicine.

First, the conditions were studied under which the individual cases occurred. The only common factor seemed to be certain straw mattresses manufactured by four different firms, all of which obtained the straw from the same source.

The second point was to determine the relation of the straw to the rash. One of the investigators exposed a bare arm and shoulder for an hour between two mattresses. Three people voluntarily slept on the mattresses for one night. Siftings from the straw were applied to the arm, under all of which circumstances the rash quickly developed, showing conclusively the relation of the straw to the disease.

Thirdly, siftings from the straw and mattresses which had been thoroughly disinfected failed to produce the rash.

And fourthly, careful inspection of the siftings of the straw disclosed living parasites, small mites, which when applied to the skin quickly produced the characteristic eruption.

SANITATION

WHEN the thoughtful historian gets far enough away from the nineteenth century to see it as a whole, no single feature will stand out with greater distinctness than the fulfilment of the prophecy of Descartes that we could be freed from an infinity of maladies both of body and mind if we had sufficient knowledge of their causes and of all the remedies with which nature has provided us. Sanitation takes its place among the great modern revolutions—political, social and intellectual. Great Britain deserves the credit for the first practical recognition of the maxim salus populi suprema lex. In the middle and latter part of the century a remarkable group of men, Southwood Smith, Chadwick, Budd, Murchison, Simon, Acland, Buchanan, J.W. Russell and Benjamin Ward Richardson, put practical sanitation on a scientific basis. Even before the full demonstration of the germ theory, they had grasped the conception that the battle had to be fought against a living contagion which found in poverty, filth and wretched homes the conditions for its existence. One terrible disease was practically wiped out in twenty-five years of hard work. It is difficult to realize that within the memory of men now living, typhus fever was one of the great scourges of our large cities, and broke out in terrible epidemics—the most fatal of all to the medical profession. In the severe epidemic in Ireland in the forties of the last century, one fifth of all the doctors in the island died of typhus. A better idea of the new crusade, made possible by new knowledge, is to be had from a consideration of certain diseases against which the fight is in active progress.

Nothing illustrates more clearly the interdependence of the sciences than the reciprocal impulse given to new researches in pathology and entomology by the discovery of the part played by insects in the transmission of disease. The flea, the louse, the bedbug, the house fly, the mosquito, the tick, have all within a few years taken their places as important transmitters of disease. The fly population may be taken as the sanitary index of a place. The discovery, too, that insects are porters of disease has led to a great extension of our knowledge of their life history. Early in the nineties, when Dr. Thayer and I were busy with the study of malaria in Baltimore, we began experiments on the possible transmission of the parasites, and a tramp, who had been a medical student, offered himself as a subject. Before we began, Dr. Thayer sought information as to the varieties of mosquitoes known in America, but sought in vain: there had at that time been no systematic study. The fundamental study which set us on the track was a demonstration by Patrick Manson, in 1879, of the association of filarian disease with the mosquito. Many observations had already been made, and were made subsequently, on the importance of insects as intermediary hosts in the animal parasites, but the first really great scientific demonstration of a widespread infection through insects was by Theobald Smith, now of Harvard University, in 1889, in a study of Texas fever of cattle. I well remember the deep impression made upon me by his original communication, which in completeness, in accuracy of detail, in Harveian precision and in practical results remains one of the most brilliant pieces of experimental work ever undertaken. It is difficult to draw comparisons in pathology; but I think, if a census were taken among the world's workers on disease, the judgment to be based on the damage to health and direct mortality, the votes would be given to malaria as the greatest single destroyer of the human race. Cholera kills its thousands, plague, in its bad years, its hundreds of thousands, yellow fever, hookworm disease, pneumonia, tuberculosis, are all terribly destructive, some only in the tropics, others in more temperate regions: but malaria is today, as it ever was, a disease to which the word pandemic is specially applicable. In this country and in Europe, its ravages have lessened enormously during the past century, but in the tropics it is everywhere and always present, the greatest single foe of the white man, and at times and places it assumes the proportions of a terrible epidemic. In one district of India alone, during the last four months of 1908, one quarter of the total population suffered from the disease and there were 400,000 deaths practically all from malaria. Today, the control of this terrible scourge is in our hands, and, as I shall tell you in a few minutes, largely because of this control, the Panama Canal is being built. No disease illustrates better the progressive evolution of scientific medicine. It is one of the oldest of known diseases. The Greeks and Graeco-Romans knew it well. It seems highly probable, as brought out by the studies of W.H.S. Jones of Cambridge, that, in part at least, the physical degeneration in Greece and Rome may have been due to the great increase of this disease. Its clinical manifestations were well known and admirably described by the older writers. In the seventeenth century, as I have already told you, the remarkable discovery was made that the bark of the cinchona tree was a specific. Between the date of the Countess's recovery in Lima and the year 1880 a colossal literature on

the disease had accumulated. Literally thousands of workers had studied the various aspects of its many problems; the literature of this country, particularly of the Southern States, in the first half of the last century may be said to be predominantly malarial. Ordinary observation carried on for long centuries had done as much as was possible. In 1880, a young French army surgeon, Laveran by name, working in Algiers, found in the microscopic examination of the blood that there were little bodies in the red blood corpuscles, amoeboid in character, which he believed to be the germs of the disease. Very little attention at first was paid to his work, and it is not surprising. It was the old story of "Wolf, wolf"; there had been so many supposed "germs" that the profession had become suspicious. Several years elapsed before Surgeon-General Sternberg called the attention of the English-speaking world to Laveran's work: it was taken up actively in Italy, and in America by Councilman, Abbott and by others among us in Baltimore. The result of these widespread observations was the confirmation in every respect of Laveran's discovery of the association with malaria of a protozoan parasite. This was step number three. Clinical observation, empirical discovery of the cure, determination of the presence of a parasite. Two other steps followed rapidly. Another army surgeon, Ronald Ross, working in India, influenced by the work of Manson, proved that the disease was transmitted by certain varieties of mosquitoes. Experiments came in to support the studies in etiology; two of those may be quoted. Mosquitoes which had bitten malarial patients in Italy were sent to London and there allowed to bite Mr. Manson, son of Dr. Manson. This gentleman had not lived out of England, where there is now no acute malaria. He had been a perfectly healthy, strong man. In a few days following the bites of the infected mosquitoes, he had a typical attack of malarial fever.

The other experiment, though of a different character, is quite as convincing. In certain regions about Rome, in the Campania, malaria is so prevalent that, in the autumn, almost everyone in the district is attacked, particularly if he is a newcomer. Dr. Sambon and a friend lived in this district from June 1 to September 1, 1900. The test was whether they could live in this exceedingly dangerous climate for the three months without catching malaria, if they used stringent precautions against the bites of mosquitoes. For this purpose the hut in which they lived was thoroughly wired, and they slept under netting. Both of these gentlemen, at the end of the period, had escaped the disease.

Then came the fifth and final triumph the prevention of the disease. The anti-malarial crusade which has been preached by Sir Ronald Ross and has been carried out successfully on a wholesale scale in Italy and in parts of India and Africa, has reduced enormously the incidence of the disease. Professor Celli of Rome, in his lecture room, has an interesting chart which shows the reduction in the mortality from malaria in Italy since the preventive measures have been adopted the deaths have fallen from above 28,000 in 1888 to below 2000 in 1910. There is needed a stirring campaign against the disease throughout the Southern States of this country.

The story of yellow fever illustrates one of the greatest practical triumphs of scientific medicine; indeed, in view of its far-reaching commercial consequences, it

may range as one of the first achievements of the race. Ever since the discovery of America, the disease has been one of its great scourges, permanently endemic in the Spanish Main, often extending to the Southern States, occasionally into the North, and not infrequently it has crossed the Atlantic. The records of the British Army in the West Indies show an appalling death rate, chiefly from this disease. At Jamaica, for the twenty years ending in 1836, the average mortality was 101 per thousand, and in certain instances as high as 178. One of the most dreaded of all infections, the periods of epidemics in the Southern States have been the occasions of a widespread panic with complete paralysis of commerce. How appalling the mortality is may be judged from the outbreak in Philadelphia in 1793, when ten thousand people died in three months. The epidemics in Spain in the early part of the nineteenth century were of great severity. A glance through La Roche's great book on the subject soon gives one an idea of the enormous importance of the disease in the history of the Southern States. Havana, ever since its foundation, had been a hotbed of yellow fever. The best minds of the profession had been attracted to a solution of the problem, but all in vain. Commission after commission had been appointed, with negative results; various organisms had been described as the cause, and there were sad illustrations of the tragedy associated with investigations undertaken without proper training or proper technique. By the year 1900, not only had the ground been cleared, but the work on insect-borne disease by Manson and by Ross had given observers an important clue. It had repeatedly been suggested that some relation existed between the bites of mosquitoes and the tropical fevers, particularly by that remarkable student, Nott of Mobile, and the French physician, Beauperthuy. But the first to announce clearly the mosquito theory of the disease was Carlos Finlay of Havana. Early in the spring of 1900, during the occupation of Cuba by the United States, a commission appointed by Surgeon-General Sternberg (himself one of the most energetic students of the disease) undertook fresh investigations. Dr. Walter Reed, Professor of Bacteriology in the Army Medical School, was placed in charge: Dr. Carroll of the United States Army, Dr. Agramonte of Havana and Dr. Jesse W. Lazear were the other members. At the Johns Hopkins Hospital, we were deeply interested in the work, as Dr. Walter Reed was a favorite pupil of Professor Welch, a warm friend of all of us, and a frequent visitor to our laboratories. Dr. Jesse Lazear, who had been my house physician, had worked with Dr. Thayer and myself at malaria, and gave up the charge of my clinical laboratory to join the commission.

Many scientific discoveries have afforded brilliant illustrations of method in research, but in the work of these men one is at a loss to know which to admire more—the remarkable accuracy and precision of the experiments, or the heroism of the men—officers and rank and file of the United States Army; they knew all the time that they were playing with death, and some of them had to pay the penalty! The demonstration was successful—beyond peradventure—that yellow fever could be transmitted by mosquitoes, and equally the negative proposition—that it could not be transmitted by fomites. An interval of twelve or more days was found to be necessary after the mosquito has bitten a yellow fever patient before it is capable of transmitting

the infection. Lazear permitted himself to be bitten by a stray mosquito while conducting his experiments in the yellow fever hospital. Bitten on the thirteenth, he sickened on the eighteenth and died on the twenty-fifth of September, but not until he had succeeded in showing in two instances that mosquitoes could convey the infection. He added another to the long list of members of the profession who have laid down their lives in search of the causes of disease. Of such men as Lazear and of Myers of the Liverpool Yellow-Fever Commission, Dutton and young Manson, may fitly be sung from the noblest of American poems the tribute which Lowell paid to Harvard's sons who fell in the War of Secession:

> Many in sad faith sought for her,
> Many with crossed hands sighed for her;
> But these, our brothers, fought for her,
> At life's dear peril wrought for her,
> So loved her that they died for her.

Fortunately, the commander-in-chief at the time in Cuba was General Leonard Wood, who had been an army surgeon, and he was the first to appreciate the importance of the discovery. The sanitation of Havana was placed in the hands of Dr. Gorgas, and within nine months the city was cleared of yellow fever, and, with the exception of a slight outbreak after the withdrawal of the American troops, has since remained free from a disease which had been its scourge for centuries. As General Wood remarked, "Reed's discovery has resulted in the saving of more lives annually than were lost in the Cuban War, and saves the commercial interest of the world a greater financial loss each year than the cost of the Cuban War. He came to Cuba at a time when one third of the officers of my staff died of yellow fever, and we were discouraged at the failure of our efforts to control it." Following the example of Havana other centres were attacked, at Vera Cruz and in Brazil, with the same success, and it is safe to say that now, thanks to the researches of Reed and his colleagues, with proper measures, no country need fear a paralyzing outbreak of this once dreaded disease.

The scientific researches in the last two decades of the nineteenth century made possible the completion of the Panama Canal. The narrow isthmus separating the two great oceans and joining the two great continents, has borne for four centuries an evil repute as the White Man's Grave. Silent upon a peak of Darien, stout Cortez with eagle eye had gazed on the Pacific. As early as 1520, Saavedra proposed to cut a canal through the Isthmus. There the first city was founded by the conquerors of the new world, which still bears the name of Panama. Spaniards, English and French fought along its coasts; to it the founder of the Bank of England took his ill-fated colony; Raleigh, Drake, Morgan the buccaneer, and scores of adventurers seeking gold, found in fever an enemy stronger than the Spaniard. For years the plague-stricken Isthmus was abandoned to the negroes and the half-breeds, until in 1849, stimulated by the gold fever of California, a railway was begun by the American engineers, Totten and Trautwine, and completed in 1855, a

railway every tie of which cost the life of a man. The dream of navigators and practical engineers was taken in hand by Ferdinand de Lesseps in January, 1881. The story of the French Canal Company is a tragedy unparalleled in the history of finance, and, one may add, in the ravages of tropical disease. Yellow fever, malaria, dysentery, typhus, carried off in nine years nearly twenty thousand employees. The mortality frequently rose above 100, sometimes to 130, 140 and in September, 1885, it reached the appalling figure of 176.97 per thousand work people. This was about the maximum death rate of the British Army in the West Indies in the nineteenth century.

When, in 1904, the United States undertook to complete the Canal, everyone felt that the success or failure was largely a matter of sanitary control. The necessary knowledge existed, but under the circumstances could it be made effective? Many were doubtful. Fortunately, there was at the time in the United States Army a man who had already served an apprenticeship in Cuba, and to whom more than to anyone else was due the disappearance of yellow fever from that island. To a man, the profession in the United States felt that could Dr. Gorgas be given full control of the sanitary affairs of the Panama Zone, the health problem, which meant the Canal problem, could be solved. There was at first a serious difficulty relating to the necessary administrative control by a sanitary officer. In an interview which Dr. Welch and I had with President Roosevelt, he keenly felt this difficulty and promised to do his best to have it rectified. It is an open secret that at first, as was perhaps only natural, matters did not go very smoothly, and it took a year or more to get properly organized. Yellow fever recurred on the Isthmus in 1904 and in the early part of 1905. It was really a colossal task in itself to undertake the cleaning of the city of Panama, which had been for centuries a pest-house, the mortality in which, even after the American occupation, reached during one month the rate of 71 per thousand living. There have been a great many brilliant illustrations of the practical application of science in preserving the health of a community and in saving life, but it is safe to say that, considering the circumstances, the past history, and the extraordinary difficulties to be overcome, the work accomplished by the Isthmian Canal Commission is unique. The year 1905 was devoted to organization; yellow fever was got rid of, and at the end of the year the total mortality among the whites had fallen to 8 per thousand, but among the blacks it was still high, 44. For three years, with a progressively increasing staff which had risen to above 40,000, of whom more than 12,000 were white, the death rate progressively fell.

Of the six important tropical diseases, plague, which reached the Isthmus one year, was quickly held in check. Yellow fever, the most dreaded of them all, never recurred. Beri-beri, which in 1906 caused sixty-eight deaths, has gradually disappeared. The hookworm disease, ankylostomiasis, has steadily decreased. From the very outset, malaria has been taken as the measure of sanitary efficiency. Throughout the French occupation it was the chief enemy to be considered, not only because of its fatality, but on account of the prolonged incapacity following infection. In 1906, out of every 1000 employees there were admitted to the hospital from malaria 821; in 1907, 424; in 1908, 282; in 1912, 110; in 1915, 51; in 1917, 14. The fatalities from the disease have fallen

from 233 in 1906 to 154 in 1907, to 73 in 1908 and to 7 in 1914. The death rate for malarial fever per 1000 population sank from 8.49 in 1906 to 0.11 in 1918. Dysentery, next to malaria the most serious of the tropical diseases in the Zone, caused 69 deaths in 1906; 48 in 1907; in 1908, with nearly 44,000, only 16 deaths, and in 1914, 4.(*) But it is when the general figures are taken that we see the extraordinary reduction that has taken place. Out of every 1000 engaged in 1908 only a third of the number died that died in 1906, and half the number that died in 1907.

(*) Figures for recent years supplied by editors.

In 1914, the death rate from disease among white males had fallen to 3.13 per thousand. The rate among the 2674 American women and children connected with the Commission was only 9.72 per thousand. But by far the most gratifying reduction is among the blacks, among whom the rate from disease had fallen to the surprisingly low figure in 1912 of 8.77 per thousand; in 1906 it was 47 per thousand. A remarkable result is that in 1908 the combined tropical diseases malaria, dysentery and beri-beri killed fewer than the two great killing diseases of the temperate zone, pneumonia and tuberculos is 127 in one group and 137 in the other. The whole story is expressed in two words, EFFECTIVE ORGANIZATION, and the special value of this experiment in sanitation is that it has been made, and made successfully, in one of the great plague spots of the world.

Month by month a little, gray-covered pamphlet was published by Colonel Gorgas, a "Report of the Department of Sanitation of the Isthmian Canal Commission." I have been one of the favored to whom it has been sent year by year, and, keenly interested as I have always been in infectious diseases, and particularly in malaria and dysentery, I doubt if anyone has read it more faithfully. In evidence of the extraordinary advance made in sanitation by Gorgas, I give a random example from one of his monthly reports (1912): In a population of more than 52,000, the death rate from disease had fallen to 7.31 per thousand; among the whites it was 2.80 and among the colored people 8.77. Not only is the profession indebted to Colonel Gorgas and his staff for this remarkable demonstration, but they have offered an example of thoroughness and efficiency which has won the admiration of the whole world. As J. B. Bishop, secretary of the Isthmian Canal Commission, has recently said: "The Americans arrived on the Isthmus in the full light of these two invaluable discoveries (the insect transmission of yellow fever and malaria). Scarcely had they begun active work when an outbreak of yellow fever occurred which caused such a panic throughout their force that nothing except the lack of steamship accommodation prevented the flight of the entire body from the Isthmus. Prompt, intelligent and vigorous application of the remedies shown to be effective by the mosquito discoveries not only checked the progress of the pest, but banished it forever from the Isthmus. In this way, and in this alone, was the building of the canal made possible. The supreme credit for its construction therefore belongs to the brave men, surgeons of the United States Army, who by their high devotion to duty and to

humanity risked their lives in Havana in 1900-1901 to demonstrate the truth of the mosquito theory."

One disease has still a special claim upon the public in this country. Some fourteen or fifteen years ago, in an address on the problem of typhoid fever in the United States, I contended that the question was no longer in the hands of the profession. In season and out of season we had preached salvation from it in volumes which fill state reports, public health journals and the medical periodicals. Though much has been done, typhoid fever remains a question of grave national concern. You lost in this state in 1911 from typhoid fever 154 lives, every one sacrificed needlessly, every one a victim of neglect and incapacity. Between 1200 and 1500 persons had a slow, lingering illness. A nation of contradictions and paradoxes— a clean people, by whom personal hygiene is carefully cultivated, but it has displayed in matters of public sanitation a carelessness simply criminal: a sensible people, among whom education is more widely diffused than in any other country, supinely acquiesces in conditions often shameful beyond expression. The solution of the problem is not very difficult. What has been done elsewhere can be done here. It is not so much in the cities, though here too the death rate is still high, but in the smaller towns and rural districts, in many of which the sanitary conditions are still those of the Middle Ages. How Galen would have turned up his nose with contempt at the water supply of the capital of the Dominion of Canada, scourged so disgracefully by typhoid fever of late! There is no question that the public is awakening, but many State Boards of Health need more efficient organization, and larger appropriations. Others are models, and it is not for lack of example that many lag behind. The health officers should have special training in sanitary science and special courses leading to diplomas in public health should be given in the medical schools. Were the health of the people made a question of public and not of party policy, only a skilled expert could possibly be appointed as a public health officer, not, as is now so often the case, the man with the political pull.

It is a long and tragic story in the annals of this country. That distinguished man, the first professor of physic in this University in the early years of last century, Dr. Nathan Smith, in that notable monograph on "Typhus Fever" (1824), tells how the disease had followed him in his various migrations, from 1787, when he began to practice, all through his career, and could he return this year, in some hundred and forty or one hundred and fifty families of the state he would find the same miserable tragedy which he had witnessed so often in the same heedless sacrifice of the young on the altar of ignorance and incapacity.

TUBERCULOSIS

IN a population of about one million, seventeen hundred persons died of tuberculosis in this state in the year 1911—a reduction in thirty years of nearly 50 per cent. A generation has changed completely our outlook on one of the most terrible scourges of the race. It is simply appalling to think of the ravages of this disease in civilized

communities. Before the discovery by Robert Koch of the bacillus, we were helpless and hopeless; in an Oriental fatalism we accepted with folded hands a state of affairs which use and wont had made bearable. Today, look at the contrast! We are both helpful and hopeful. Knowing the cause of the disease, knowing how it is distributed, better able to recognize the early symptoms, better able to cure a very considerable portion of all early cases, we have gradually organized an enthusiastic campaign which is certain to lead to victory. The figures I have quoted indicate how progressively the mortality is falling. Only, do not let us be disappointed if this comparatively rapid fall is not steadily maintained in the country at large. It is a long fight against a strong enemy, and at the lowest estimate it will take several generations before tuberculosis is placed at last, with leprosy and typhus, among the vanquished diseases. Education, organization, cooperation—these are the weapons of our warfare. Into details I need not enter. The work done by the National Association under the strong guidance of its secretary, Mr. Farrand, the pioneer studies of Trudeau and the optimism which he has brought into the campaign, the splendid demonstration by the New York Board of Health of what organization can do, have helped immensely in this world-wide conflict.

SOME years ago, in an address at Edinburgh, I spoke of the triple gospel which man has published—of his soul, of his goods, of his body. This third gospel, the gospel of his body, which brings man into relation with nature, has been a true evangelion, the glad tidings of the final conquest of nature by which man has redeemed thousands of his fellow men from sickness and from death.

If, in the memorable phrase of the Greek philosopher, Prodicus, "That which benefits human life is God," we may see in this new gospel a link betwixt us and the crowning race of those who eye to eye shall look on knowledge, and in whose hand nature shall be an open book—an approach to the glorious day of which Shelley sings so gloriously:

> Happiness
> And Science dawn though late upon the earth;
> Peace cheers the mind, health renovates the frame;
> Disease and pleasure cease to mingle here,
> Reason and passion cease to combat there,
> Whilst mind unfettered o'er the earth extends
> Its all-subduing energies, and wields
> The sceptre of a vast dominion there.
>
> (Daemon of the World, Pt. II.)

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Dr. Ashley White is a graduate of the prestigious University of North Carolina at Chapel Hill, where he completed his surgical training. Founded in the 1700's the University of North Carolina is the oldest state university in the United States and is one of the original eight flagship public colleges known as Ivy. Dr. White also served on the University of North Carolina's Honor Court. He studied doctorate level forensic anthropology and has held membership in a top national pathology academy as well as Fellowship status in a maxillofacial surgery association. Dr. White also earned a Baccalaureate of Science Degree in Biochemistry from East Carolina University and was an investigative researcher at the East Carolina University School of Medicine. Dr. White held a post graduate research position at preeminent Duke University, consistently placed among the world's top universities. He worked with the School of Engineering on a NASA funded project. Dr. White also has been a member of the Mensa special interest group founded Research Triangle National Security and Intelligence Think Tank. Dr. White has been a medical staff physician with surgical privileges at three regional medical centers. His practice focus has been oral medicine and surgical pathology. Dr. White is a professional member of the Archaeological Institute of America, founded in 1879 and chartered by the United States Congress. The AIA is North America's oldest and largest organization devoted to the world of archaeology. Over the last two decades, Dr. White has been researching ancient diseases and their initial presentations for prevention of future pandemic plagues. This evidence based paleopathology research has granted Dr. White access to some of the world's most sensitive archaeological sites. These locations have been in England, Scotland, North and Central America, Nine additional countries in Europe, Asia—including Russia and China, the Middle East, North and Sub-Sahara Africa, and South America including the Amazon Basin. This comprehensive Atlas was originally conceived for doctors providing needed care in dangerous, rugged and remote situations often created by catastrophe, disasters, epidemics, and military conflicts. It is within these serious environments that this Atlas can assist practitioners find the most obscure and difficult diagnosis where access to x-rays and modern laboratory equipment are often impossible. Designed with a unique reference style of key words tagged to known medical systems the Atlas functions as an easy to use clinical field manual whether in use in an advanced medical care unit or in the harsh realm of the jungle. This extensive compendium of rare medical findings, together with an incredible group of landmark essays make this the most complete Atlas of physical signs ever published.

Dr. White lives with his wife and son on their ranch located in North Central Florida and their home in the Georgia Blue Ridge Mountains. To learn more about the author or book ordering please visit MuseumPress.org

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Dr. Ashley White is a graduate of the University of North Carolina at Chapel Hill, where he earned his surgical degree. He also completed forensic anthropology training and has held membership in a top national pathology academy, as well as, Fellowship status in a surgery association. Dr. White also earned a Baccalaureate of Science Degree in Biochemistry from East Carolina University and was a research associate at the East Carolina University School of Medicine and at Duke University. Dr. White has been a medical staff physician with surgical privileges at three regional medical centers. His practice focus has been oral medicine and surgical pathology. Dr. White is a professional member of the Archaeological Institute of America, founded in 1879 and chartered by the United States Congress. Dr. White lives with his wife and son on their ranch located in North Central Florida and their home in the Georgia Blue Ridge Mountains. To learn more about the author or book ordering please visit MuseumPress.org

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