Thesis.

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S Y P H I L I S.

By

EDWARD LAWRENCE PHILLIPS,
M. B., C. M.
(Edin.),
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Penrhys Road,

Y S T R A D,

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S Y P H I L I S.

NOMENCLATURE.

It is scarcely possible to find a disease which equals syphilis in the number and variety of its SYNONYMS. It was quite an unknown affection when it first made its appearance in Europe, and a satisfactory designation had to be found for it. For long it was known under the somewhat vague designation of "Lues Venerea"; and it was spoken of by the laity as the "Pox" and the "Bad Disorder." The term "Morbus Gallicus" had a considerable and sustained vogue; and a number of local affections, having no relation whatever to syphilis, were for a considerable time confounded with it. The French call it "Vérole," the Germans "Lustseicche" and "Krankheit der Franzossen," the Spanish "Sifilis," the Italians "Sifilide," and the Swedish "Radezyge." Numerous synonyms came to be invented through the desire of certain nations to take a nosological revenge upon others. Thus, the people of Naples called it the "French Disease" when it first appeared in their beloved city at the time when the French troops were laying siege thereto. The French, on the other hand, retorted by designating syphilis as the "Disease of Naples," though the Germans and English rather detracted from the popularity of the term by speaking of the affection as "French Pox." The same idea appears in such other designations as the "Turkish Disease," the "Disease of Christians," the "Polish Disease," the "German Disease," the "Portuguese Disease," and the "Spanish Disease." Such tokens of racial animosity are now, however, mere literary curiosities and purely of historical interest. The Germans, Italians and Spaniards were the greatest advocates of the term "Morbus Gallicus," which was afterwards shortened to "Morbus" by the laity. "Morbus Venereus" is a term concerning which there has been much disputation amongst philologists. From the etiological standpoint syphilis and morbus venereus are not synonymous terms; the former may be a morbus venereus, as it is in the vast majority of instances; but, nevertheless, it is, as we shall see, not necessarily so. It is interesting, though not strange, to note that the superstitions of the period found expression in some of the names invented for this disease, the clients of various Saints attributing its cure to their spiritual Patron. Thus we have introduced into the nomenclature of syphilis such names as "St.

Job" and "St. Main," which, however, by no means exhaust the list. Such popular procedure was deprecated by the physicians of the period who, with a view of demonstrating their neutrality towards popular superstitions and racial prejudices, gave syphilis names expressive of their respective nosological interpretations. From its supposed resemblance to Asiatic lepra some of them called it "Elephantiasis," and others christened it "Sahafati" from its alleged similarity to a peculiar cutaneous lesion prevalent amongst the people of Arabia. This was a period of astrological cult, and its influence became apparent in the nomenclature of the disease. Curiosity regarding Mars and Saturn was apparently just as keen then as now, perhaps more so; and this found expression in the name "Patursa Saturnine Disease" which the affection received in view of its supposed causation thereby. By many syphilis was at this time confounded with smallpox on its first appearance amongst them; in order to distinguish the two, the French called it the "Great Pox," and the custom was also observed for a time by the Germans, the Flemish, and the Picardy people. As early as the end of the fifteenth century the French called the disease "La Grosse Vèrole," the term being first used in Parisian Parliamentary enactment of 1496. We shall presently see that the term "Syphilis" was in all probability coined with etymological reference to the most frequent mode of origin of the disease, and used for the first time, incorporated in a myth, by the Veronese Physician Hieronymus Frascatorius (Syphilis sive Morbus Gallicus, Lib.iii,,1521), who related, in a poem concerning the disease, that a herdsman of King Alkithous, Syphilis by name, was afflicted by it from Apollo as his punishment for paying divine honour to the King instead of to the god. About this time the Spaniards called it "bubas" (pox); the Germans spoke of it as "purpeln," "Mal Franzos," and "Welsche Bossen;" and other contemporary writers designated syphilis as "Montagra" or "Mentulagra," "Patursae," and "Pudendagra," etc. The name "Maladie Vènèrienne" was, in 1556, given to the affection by a medical practitioner in Rouen, who noticed that sexual intercourse was the most common method of contracting the malady. This had a considerable vogue, but was ultimately replaced by the Latin equivalent "Lues Venerea." The name "Sibbens" or "Sewens" was given to the disease when prevalent in the west of Scotland, especially in the counties of Ayr, Dumfries, Wigton, etc.; it was first observed there towards the end of the seventeenth century (1694), at which period it was said to have been imported by the soldiers of Oliver Cromwell. The identity of the affection with syphilis has never been seriously called in question. In Scotland the name "Grangfore," - a corruption of the French "a la grande gorre," the local designation of the affection in Rouen, - was also much used by certain classes.

D E F I N I T I O N .

Syphilis is an eminently contagious, - in the strict sense of the word not infectious, - disease of slow evolution, long duration, and irregular and chronic, though progressive, course, due to a specific microorganism, and capable of attacking any and all tissues and organs of the body. The affection manifests itself in a multitude of phenomena having their origin for the most part in an indolent inflammatory process accompanied by a new-cell formation of low grade.

The affection is acquired by inoculation with the blood or morbid secretions of an individual offspring. Generally speaking, one attack confers immunity against others.

It is therefore an affection peculiar in its absolute etiological independence to any other disease, the unicity of the casual agent and the certainty of the disease following infection therewith being undisputed. The contention of the dualists are ended, the more so since spirochaete pallida has been established as the cause of the disease with a probability bordering on certainty. Prior to the discovery of that organism the disease was unique in that it obstinately defied the most skilful and untiring investigators in their endeavours to unravel its complexity and determine its true nature. Nevertheless, while evading recognition, there was, even then, facts enough in existence to make it reasonably certain that the causative agent was of a bacteriological sort, and that syphilis was a germ disease. No other theory of its origin could explain the symptoms manifested in its course so well as this; and as time went on it became more and more apparent that the isolation and detection of the specific microorganism could not be much longer delayed.

The affection may be either inherited or acquired, in the former case parental influence is operative - in the latter there is infection of a sound individual with the virus as it comes from a person suffering with the disease. These two forms of the malady differ from each other very materially in their course, their symptoms, and their gravity as concerns the life of the individual so afflicted. The acquired form is a disease largely amenable to treatment and seldom imperilling the life of the affected person, while the mutilating effects of the inherited form are, when the patient's life is spared, manifested in every organ and tissue of the body, and the death-rate is simply appalling. Sexual intercourse is mostly responsible for the acquired form of syphilis; and it is on account of this fact that the affection is classed with and spoken of as a venereal disease. Nevertheless, as we shall presently see, it is very often contracted in ways other than this; and the affection acquired in

in a manner independent of sexual gratification is spoken of as "syphilis Insontium," or syphilis in the innocent, but its course is just the same as when contracted in the most usual way. In testimony of its - strictly speaking - non-infectivity, cited may be the fact that the casual agent is never transmitted by the air, the easiest and most usual form of propagation being by direct and close contact with an individual suffering from the disease. If the conditions are favourable, there is then a direct passage of the virus from the unsound to the sound person. Such method of acquiring the disease is said to be by immediate infection. When the virus is transmitted by means of some intervening carrier the infection is said to be mediate. In order that the virus shall make its entrance into the system it must be brought into contact with some solution of continuity in the skin, or in contact with the mucous surfaces. It cannot make its way through the sound integument. The break in the skin may be exceedingly minute; it may be the merest abrasion or pinpoint opening, but it is always there as an open door through which the poison may enter. Upon the mucous and pseudo-mucous surfaces there is good reason for believing that such an opening is not so necessary. Here the virus, if implanted and allowed to remain undisturbed, can make its way through the moist epithelial coverings to the tissues beneath, and the more so if a mucous or sebaceous follicle be invaded. One of the most interesting points in connection with the disease is that, in the event of the wound not being infected by pus at the time when the syphilitic virus is deposited thereon, the wound closes and the parts appear unaffected. In this condition they remain for a variable period of time - usually about twenty-one days. This time, in which there are no manifestations of any trouble whatever, is known as the first period of incubation. Then the first symptom of syphilitic infection makes its appearance. This is in the form of a sore at the exact point where infection took place. This sore is known by various names, as the hard chancre, initial sclerosis, or the initial lesion of syphilis. While this first lesion of syphilis is always strictly circumscribed and definite in its site, it is not true that the poison of the disease is entirely localised within it. The course of the disease is neither aborted nor influenced by extirpation of the chancre: so that at least partial invasion of the system has taken place before its appearance. The chancre may assume various forms. It follows a sluggish, indolent course, lasting from a few weeks to several months; and then, if it has been uncomplicated by the access of pyogenic microorganisms, it disappears entirely, leaving no relics of its existence behind. At the same time that the chancre appears there are characteristic changes to be observed in connection with the neighbouring lymphatics and glands. They enlarge, become indurated and hard, but are rarely painful and seldom proceed to suppuration.

The condition known as syphilitic bubo is formed. What is termed as the second period of incubation commences with the appearance of the chancre. This period is ill-defined and indefinite in its extent. It is made to include the development of the chancre, the enlargement of the neighbouring lymphatic glands, and that series of changes which take place in the system before the appearance of eruptions of the skin. During this time the patient may retain the full vigour and appearance of health, or there may be prodromal symptoms, such as malaise, hebetude, headache, slight muscular pains, and occasionally a low or high temperature, showing that the system is slowly being brought under the influence of the specific poison. Then follows the outbreak of the first eruption in the skin, and the establishment of the disease within the patient's system is forthwith complete. The course of the affection is up to this time reasonably certain and unvarying in different individuals. There are about the same changes, and they occur in about the same succession, differing only in the length of time occupied in their evolution and development. After the appearance of lesions upon the skin and the thorough invasion of the system, no such orderly succession of phenomena can be predicted. The trouble may end at once; it may become quiescent for a time and then break out with added intensity and vigour; it may go through a series of changes increasing in energy and variety of expression until it expends its force and then subsides; or it may enter at once upon a malignant and destructive course in which the integrity of various organs may be involved or the life of the patient very seriously imperilled. In every instance syphilis is a constitutional disease. The involvement of the system may be severe, or it may be so slight as to give rise to scarcely any appreciable symptoms. Limitation of all symptoms to the chancre means that the systemic manifestations have been mild and the skin affections overlooked, or that the nature of the local lesion presented was misunderstood. Syphilis is essentially a chronic disease, persisting usually for a long period of time and seldom presenting symptoms that can be classed as acute. Under favourable and early treatment most cases recover in from two to four years. Some cases are so mild that all symptoms vanish after the expiration of a few months, and never reappear. This happens at times with no treatment at all, or that only of the most indifferent nature. In other cases the symptoms are severe from the beginning. Osseous and cerebral lesions appear with or precede the cutaneous rashes. The external integument may be quickly filled with ulcerating gummata instead of the more frequent macules and papules. The integrity of every organ in the body may be threatened and a fatal ending may ensue. This, fortunately rare, form of syphilis has been termed by some "galloping" or "lightning" syphilis; and the terms are sufficiently apt and appropriate to merit their retention in the nomenclature of the disease. Clinically, the affection

may be divided into three stages - respectively, the primary, the secondary, and the tertiary stages. The first-mentioned begins with the appearance of the initial lesion or chancre, and lasts until the development of the generalised cutaneous rashes. The occurrence of the latter marks the commencement of the second stage, which is more indefinite in course and extent, but was made by the author of this classification, Ricord, to include the skin troubles observed in the course of the affection, loss of hair, lesions of the nails, angina, mucous patches in the mouth and elsewhere on the mucous surfaces. The tertiary stage he made to follow the secondary, and was still more indefinite in its course. It was supposed to begin at about the end of the first year and to continue until the termination of the disease. This classification, while of great service in the past, is not now regarded with the favour once accorded it. Its errors are becoming more apparent every day, and the time is at hand when it may be entirely discarded. Its chief fallacy lies in the fact that it endeavours to make syphilis conform to a time-schedule and a regular, unvarying succession of changes. Such a course syphilis does not pursue, and any attempt to make it appear that it does is misleading in the extreme. The tertiary stage in many cases never makes its appearance, all symptoms of the disease ending with the termination of the cutaneous affections. Again, the secondary stage, so far as any of its manifestations are concerned, may be wanting entirely, and so-called tertiary symptoms follow close on the appearance of the chancre. The primary stage is the only one described by the clinician in question in which the symptoms are possessed of sufficient constancy and definiteness to merit their being grouped as peculiar to one period of the syphilitic attack. So, then, it must be borne in mind, in attempting a definition of syphilis, that it is a disease which does not follow any definite course and manifest itself in a series of symptoms appearing at a certain time after the development of the chancre, these running their course within specified and exact limits, then to disappear and be succeeded by another set of symptoms equally clear and concise; but we must remember that it is an affection which, starting from a fixed point, pursues many different lines of evolution and expresses itself in a great variety of phenomena.

H I S T O R Y .

In view of the recognised propagation of syphilis by sexual intercourse the antiquity of the disease is a matter which admits of no doubt. Nevertheless, it is interesting and instructive to trace the prevalence of the malady back into the remote ages of the world's history through the dim and shadowy vista of centuries gone by. Every period of the world's history is marked by references to the disease, and particularly as occurring from impure sexual intercourse. Even the Scriptures and mythical disquisitions make mention of its origination in this way, though in some of the very early records it is gonorrhoea which is undoubtedly referred to. Bearing in mind the nosological coalition of the two affections, the interest thereof to us still remains. Common as references to syphilis were in the Middle Ages, there are full accounts of ulcerative lesions of the male and female generative organs in medical publications prior to that date, and the poets of the classical ages frequently dwell upon its prevalence and the manner of its manifestation. The doctrine of antiquity is therefore well attested. In his "Treatise on Venereal Diseases (T.ii.,p.346) Astruc mentions that the Chinese physicians speak of syphilis as a disease of great antiquity. Dabry's well-known work (Medicine amongst the Chinese, Paris, 1863) collects and compiles these writings, the oldest of which date back to the time of Hoang-ty, nearly three thousand years, B.C. Although the treatise contains not a few doubtful and improbable points, it is certain that in China syphilis is one of the most ancient of all diseases, many of the physicians of antiquity giving minute descriptions of the lesion we know as chancre; they tell us, for instance, that a corroding ulcer, produced by a special poison under the influence of direct contact, is encountered on both male and female sexual organs, as well as about the anus, within the urethra, in the nose and mouth and throat. The lesion they describe also as commencing about the third or the ninth day, either by itself or accompanied by a variety of other allied affections. It does so as a small red spot, elevated in its centre, and causing either pain or intense itching, followed by the development of a white spot in the middle, which proceeds to cavity-formation and insensibly becomes larger and deeper. It is also interesting to note the fact mentioned that at the base there is observed and felt a hardish, thick, white skin, with edges no less hard and irregularly indented. The mouth, nose and throat undergo ulceration, and mucous patches form in the anal region. In other words, the secondary stage of syphilis is fully described; and it is also a fact that these early writers treat largely of the tertiary lesions as observed at the present day, particularly of the hideous deformity produced by the disease when attacking the

nose. It also appears that the physicians of India were well acquainted with syphilis. The curious treatise on medicine known as the Sucrutas, written sixteen hundred or more years ago, contains references to a widely prevalent affection which cannot be other than syphilis. The narratives for India appear to have been quite as authoritative as those of Hippocrates elsewhere; and we find that both local and general phenomena are minutely described. We read that the poison of the disease gains access to the interior of the male procreative organ, corrupts the blood, gives rise to irritation, and then a wound, which discharges and heals up after the formation of scabs, not, however, before destroying the penis and rendering the sufferer sterile. In the case of the female the virus, after entering the sexual organs, produces sanious and stinking excrescences. It is apparently chancre which is referred to; but in another part of the work (Hessler's translation) we are told that the virus secures general distribution throughout the body, leaving its local site and producing warty excrescences in the mouth, eyes, ears and the nose; that affection of the ears gives rise to deafness, pain, and a stinking aroma; that affection of the nose is accompanied by sneezing, symptoms as of a local cold, and dyspnoea; that the nasal cavities stink; that the head aches, and that warts are to be observed in considerable profusion on the patient's skin, and not a few nodes and buboes elsewhere. The ancient ecclesiastical writings of India confirm the existence of the disease in that country in very early times, particularly during the time that the worship of Venus was there in great vogue. Thus, according to Sonnerat (Voyage to India and China), Civa was punished by the gods with a destructive gangrene of the genital organs commonly communicated from women to men, this being arrested only by the prayers of the faithful on his behalf. Klein (De Morbi Venerei Curatione in India Orientali Usitata, 1795) tells us, giving the annals of Malabar as his authority, that syphilis has been known in those parts for many centuries, and that the affection was cured by mercury over nine hundred years ago. But, according to Strabon (Geography, pp. 1027,1039), Ctesias(Judic.,XV.), Lucien (Macrob., c.IV), and Pline (Hist. Nat., XVII.,c.ii), it was only comparatively seldom that syphilitic and other affections of the sexual organs were observed amongst the people of India, who by the Greeks were regarded as long-lived on account of their comparative chastity and the inimical influence of their climate towards the occurrence and propagation of the disease. The Bible has often been searched for references to the prevalence of syphilis (Numbers, Chap. XV., V.8; Chap. XXi., V 16 & 17), the interest of the medical erudite mainly concentrating around the plague of Baal Peor, the description of the ravages of which amongst the Jews, however, do not exactly tally with syphilis as we know it. The same may be said for the thirteenth chapter of Leviticus, the cutaneous and trying cutaneous affections of Job, and so forth. The passage in Philo (Bosquillon, - Translation of Bell's

Treaty, T.ii.,p.48), which mentions the introduction of circumcision for the cure of a serious and intractable anthrax-like disease, may possibly be included in the same category. Ancient practitioners in Greece now and then refer to what must have been syphilis; and the great father of medicine, Hippocrates, thus deals with the affection as in his time observed Opera Omnia, On Epidemics, Lib.iii., Sect.iii., Par. 7): "Many had aphthae and ulcerations of the mouth, frequent fluxions of the generative organs, ulcers tumours internal and external, and swellings in the groins. Moist, chronic, and painful ophthalmias; granulations on the inner and outer surfaces of the eyelids, which destroyed the sight of many persons, and which are called 'fics'. The other sores and the genital organs were also the seat of numerous fungous growths. In summer were seen a great number of anthrax, and other affections which are called septic; also pustular eruptions and, in many, extensive vesicular eruptions." The fact that severe affections of the sexual organs resulted forthwith in the introduction of the worship of Bacchus from India to Greece mythical writings dealing with the cult, those of Natalis Comes (Mythologiae, sive Explicationes Fabulorum, Lib. X., Ed. Frankf., 1588, Viii., p.478), for instance, wherein we learn that, consequent on the Athenians refusing to do honour to the images of Bacchus imported into Attica by Pegasus of Boeotia, that god afflicted the genitalia of mankind with an exceedingly severe disease. The same author tells (op. cit., p.528) of the mythical introduction of the worship of Priapus into Lampascus; according to him, Aphrodite, after her impregnation by Bacchus, and during her journey im India, was delivered of Priapus on her return to Lampascus; that notorious individual, after a temporary sojourn in the city, was banished by the populace thereof on account of his shameless regard for the chastity of their wives. In revenge for this contempt of his dignity, the gods sent amongst them a "most severe disease of the genital organs," which ran riot amongst them until the exiled Priapus was recalled. The story is probably a fiction, but it nonetheless shows that a far severer disease of the sexual organs than gonorrhoea was known to the ancients at a very early period of the civilised world's history. The physicians of ancient Rome give minute descriptions of affections of the generative organs. The oldest of them, Celsus, devotes much space to their consideration, and mentions that, owing to innate modesty, diseases of these parts failed to receive the attention and study their gravity deserved. He tells us that on retraction of a phymotic prepuce, - sometimes a matter of great difficulty, - ulcers are seen, upon either the inner or outer surface thereof, on the glans or on the penis behind the glans, which are either clean and dry or moist and discharging a purulent secretion. Hard and soft chancres are here referred to; and he also mentions ulcers of the buccal cavity and nose and tonsils, as well as four varieties of impetigo and two of herpes of undoubtedly syphilitic causation.

Aretacus (De causis et signis acutorum morborum, Lib. i., Chap. Viii.) is even more explicit in his descriptions, and in one part of his work he says that in certain cases the uvula is destroyed to the bones of the palate and the fauces to the root of the tongue and epiglottis. The Romans were therefore quite familiar with the appearances of the primary and secondary syphilitic lesions, and the majority of our author's contemporaries dwell upon the difference between dry and clean and moist and purulent ulcerations. Furthermore, Galen (Method. Med., Lib.v., Chap.xv.) speaks of psoriasis scroti, which is a peculiar itching induration or even ulceration of the scrotum; and Aetius (Tetrabiblos, iv., S.ii.,Chap.iii) describes a secondary syphilitic affection, the occurrence of pustules about the genital organs externally. By reason of its frequent occurrence at Rome and Alexandria amongst sodomists (Aetius. - Op.cit.,Lib.iii.,C.iii), the "sykos" of the Greeks, or "ficus" of the Romans, bears an analogy to mucous patches; the lesion in question was a moist ulcerating tubercle of round outline, and, according to Hippocrates who also observed it (and called it "kion,"), a most repulsive odour. Tertiary affections are comparatively seldom mentioned by the writers of antiquity. Nevertheless, Plutarch and Archigenes (Galen. - De Locis Affectis,ii.,Chap. viii.) mention the prevalence of periosteal pains of a deep-seated and extremely painful character; and the author parenthetically noted calls them osteocopic (ostokopi). Furthermore, Marcellus Empiricus (De Medicamentis, Chap.xxxiv.) informs us that he often came across cases of (syphilitic) ulcerating and serpiginous tibial affections. It is therefore certain that the Greek and Latin physicians had frequently to deal with instances of local genital affections, some of which, especially the dry and moist ulcerations, correspond to well-known varieties of the initial lesion; and the same is in all probability true as regards the tertiary lesions of the disease. The satirical poets, rather then the orthodox practitioners, must be depended upon for information regarding knowledge of contagious venereal diseases in imperial Rome; and the epigramatic effusions of Martial (Epigram.,Lib. iii.,71) are particularly interesting in this respect, especially the one which relates how the drunken Naevolus communicated contagious sores to a young slave during sexual intercourse. The same poet also speaks of the contagiosity of condylomatous excrescences, alteration of the voice in sodomites, and ulcerations of the mouth in alcoholics. Vocal troubles are also referred to by Dion Chrysostome (Orationes ex Recensione,No.33). "They say," proceeds this author, "that Aphrodite, to punish the women of Lesbos, has sent them a disease of the armpits; well, it is thus that the divine anger has destroyed the noses of the greater number of you, and hence has arisen this particular sound." It is not easy to accurately determine the syphilitic nature of the ancient Roman affections, Mentagra and Morbus Campanus; the latter, according to

Horace's description (Sat.,Lib.i.,v.), is probably analogous to our syphilis, it was peculiar to drunkards, and left deep and unsightly scars behind when it healed. It is also very difficult to trace the establishment of syphilis amongst the ancient peoples of America. According to Prescott and Irving (New York Jour. of Med., March, 1844) whose authority as historians of American antiquity has been called in question, the ancient nations of America, far from having given syphilis to the Europeans, rather received it from the latter, since this disease has been observed amongst them in proportion as their relations with the people of Europe were more constant and intimate. On the other hand,a far more reliable authority, the Abbé Bratteur de Bourbourg (History of the Civilised Nations of Mexico and Central America prior to the Time of Columbus, Paris,1875,T.i.,p.181) says that perusal of a host of original documents in the languages of the tribes of the valley of Anahuac and elsewhere has convinced him that syphilis existed in America long before its discovery by Columbus. He tells us that these documents minutely describe the deification of Manahault and his metamorphosis into a sun. The custom was to light a funeral pile, so that sufferers might throw themselves thereon, and after cremation have their asnes arise as a god for the illumination of the whole world. Manahault was one day a spectator, suffering from a terrible and incurable affection, so that death would be a happy relief from the trials of his loathsome lesions. Still he hesitated to cast himself into the roaring flames; but after suave stimulating persuasion of the celebrants he did so and was burnt to ashes in an instant. Thus the apotheosis of the man occurred, and the name is used to express carruption of the limbs consequent upon an erotic domination. Spanish legends dealing with the god mention Manahault as Buboso, or the syphilitic one; and various other terms, as Puz, - the stinking discharge of the wounds of the above, - have been used as qualifications. We thus see that both in biblical and mythical times the morbific consequences of impure sexual intercourse were well known, and most likely syphilis as much as the gonorrhoea with which it was so long confused. The extreme scantiness of the knowledge of venereal diseases in ancient times may be variously explained. During that early period of the civilised world's history, even when immorality was at its acme, a certain inversion of the moral sense kept the public from confiding their genital affections to the care of practising physicians, it being considered disgraceful and degrading to expose the private parts. This was especially true as regarded women; and even the physicians themselves considered it beneath their dignity and office to have anything to do with venereal diseases.

We now come to the prevalence of syphilis in the Middle Ages, concerning which our sources of information are much more reliable than those just considered,

though not too numerous and relating to local generative troubles and the somewhat comprehensive malady known as lepra. According to Daremberg (Annals of Skin Diseases and of Syphilis,T.iv.,p.275,Paris,1851-52),some of the ninth century manuscripts tell of ulcerative lesions of the sexual organs and anus; and confirmatory evidence of the prevalence thereof is to be found in contemporary Arabian and other writings. In the year 1270 Guillaume de Salicet (Chirurgia,Lib.i.,Chap.xlviii,1270)speaks of corruptive lesions in virgins and about the prepuce in consequence of impure sexual intercourse; and somewhat later Lanfranc de Milan (Practica seu Ars Completa Chirurgiae,Tract.iii.,Doct.ii.,C.ii., & Doct.iii.,C.ii) referred to the occurrence of soft and hard excrescences on the prepuce. Valescus of Tarentum (Philonium, Lib.vi.,C.vi.,Fol.156,1502) gives an excellent and minute description of what we recognise as the initial lesion of syphilis, which differs from that of some others in having no resemblance to chancroid. In later writings of the period we are considering it as easy to interpret the observation of chancres and secondary phenomena - particular interest attaching to the writings of such authors as Roger (Chirurgiae,Tract.i.,lvi.,65,- Venetian Surgical Collection,1519), Roland(Chirurgiae, Lib.iii.,C.xxxi.) Thèodoric (Ibid.,Lib.iii.,C.xxxviii.), Trotula (Curand.Oegritud.Muliebr.Libell,,Leipsick,1778), Arnauld de Villeneuve (Breviar,ii.,29,opp.Lugdun.,1532, Fol.1776), Guy de Chauliac (Chirurg.,Tract.iv.,Doct.ii., C.vii.), Jean de Concorrège (New Practice of Medicine, Tract.iv.,C.v.,Venet.,1515,p.640), and Graddesden (Rosa Anglica,Lib.ii.,C.xviii.); some of the lascivious poets, such as Villon (Works of Fr.Villon,Formey Edition,1742, p.149) and Pacificus Maximus (Florentine Edition of his Poems,1489) may be consulted with advantage. It is obvious from such thirteenth century writings as those of Littré that contemporary physicians were well acquainted with secondary syphilitic symptoms arising from systemic infection following in the local chancre. Most of the genital diseases of the Middle Ages, are, however, described under leprosy, from the descriptions of which affection it is easy enough to eliminate the salient features of syphilis which are therewith included. Hermann Friedberg (Treatise on Venereal Diseases,Berlin,1865)devotes considerable space to this point, as does also Corradi (Cause of Constitutional Syphilis,etc.,Milan,1866). Owing to the fact that the lepra of that time was a contagious disease, it would seem that syphilis was confounded with it in not a few instances. Insisting on the contagiosity of the former affection we find, amongst many others, Gordon (Lilii Particula,i.,C.xxii.,Venetiis,1496), who says that he once had occasion to treat a leprous countess in Montpellier, and afterwards his locum tenens who seduced her and became leprous in usual course. Schoff (Libr.de Lepra) reports a similar experience; and the occurrence of leprous troubles is also narrated as following impure sexual intercourse by the above-quoted Gordon (loc. cit.) and Michael Scotus (De

Procreatione Hominis Physionomia,C.vi.,1477), as well as Manardi de Ferrare (Epistolae Medicinales,1525), and Théodoric (Chirurgia,Lib.vi.,C.lv). On the other hand the fact is denied by Gaddesden (loc. cit.). Bocellin (On the Contagiosity and Infectivity of Lepra, Lyons, 1540,C.ii.) tells us that Valescus de Tarente, Guy de Chauliac, and Discus Fiorentinus assign three causes to lepra; the primary cause is of a dual nature, either introduced into the abdomen of a mother impregnated at the menstrual period or proceeding from the semen of a leper, and inheritance another originator - stinking breath, hoarseness of voice, and snuffling being common symptoms. The comprehensive lepra, then, included a variety of affections of which syphilis was one. Hensler (loc. cit.) thought that leprosy degenerated into syphilis, and in his theory he had the support of Sprengel (ibid.), they both finding justicication for their hypothesis in the fact that meteorological conditions may, in certain circumstances and at certain times, so modify the character of chronic affections as to make them epidemic, and also on the ground that not a few of the practitioners who had written on the so-called French disease contended that syphilis was the old lepra,-particularly the saphati, - appearing in a novel and unusual form. The fact that the gradual decline of elephantiasis in Europe occurred contemporaneously with the appearance of the great epidemic of the fifteenth century - presently to be described - would render greater plausibility to their contention. The perfect analogy between elephantiasis and the so-called French disease, and the existence of syphilis prior to the year 1495, seems obvious from a letter which Pierre Martyr wrote to his colleague Arias Barbosa (Opus Epistolar.,Edition 1670,p.34) telling him about his affliction. It is dated the month of April, and proceeds: "You write me that you are afflicted with a particular disease, called bubas by the Spanish, galico by the Italians, elephantiasis by some physicians, and in various ways by others. You describe with incomparable elegance your evil, your losses, the uneasiness in your joints, the weakness of your ligaments, the excruciating pains in your articulations, and lastly, the ulcers and foetor of your breath." It is easy in this letter to recognise certain classical manifestations of syphilis. Other writings of the period deal with the manifestations of the disease, but not with the disease itself. But we cannot marvel at the initial ignorance of the ancients regarding the link which connects the primary sore with the consequent chronic constitutional symptoms. Their ideas of the affection were confined to local pathology; and after the physicians of that time commenced to acquire some knowledge of one disease of that kind, when they made acquaintance with leprosy, they still considered, as did their successors of the period in the profession, all varieties of local and general morbid processes as an outcome, dwelling especially upon the process localised in the skin and mucous membranes. They had not any clear notion of the group of symptoms distinctive of the disease; and, just as a plague was their idea of severe epidemic sickness running an acute course, so

they took leprosy as the representative of various chronic diseases. That syphilis played a leading part amongst the latter may be inferred from the widely prevalent and generally accepted opinion that lepra invariably originated from intercourse with a contaminated, dirty woman. I have already alluded to the great and ever-famous outbreak of syphilis towards the end of the fifteenth century; and its main characteristics may now be considered at some length, the more so as it assumed a malignant and widespread course. It excited an enormous amount of interest everywhere at the time, and the more so as both the profession and the laity were confronted with an almost unknown disease. It is owing to this outbreak that practitioners commenced to take a really intelligent interest in syphilis, an interest which continues unabated at the present day and the direct reflex thereof. It is impossible to say when and how this epidemic occurred in the first instance. Fulgosi (de Dictis Factisque Memorabilibus Collect.,Milan,1509) says that the world was attacked by a new disease two years before the campaign of the French against the inhabitants of Naples, that is to say, in 1492; and Pomarus (Chronica der Sachsen und Niedersachsen,T.ii., 1496) mentions the appearance of the affection in Saxony one year later. Sprengel (Essay on the History of Medicine, Paris,1810,T.ii.,p.564) tells how, in the summer of 1493, syphilis showed itself at Halle, in the Mark of Brandenburg, at Brunswick, and in Mecklenburg; and Sciphover (Chronica Archicomit.,T.ii.,p.188) mentions that in the following year the malady was seen in Westphalia, from which it spread to Westphalia, the Baltic Coast, Pomerania, and Prussia. In the same year, Linturius informs us (Append. ad Fascicul. Tempor.,T.ii., pp.106,108,110) the disease beoke out in Suabia, on the banks of the Rhine, in Franconia, and in Bavaria. In 1496 the Parisian Parliament decreed that vigorous measures should be taken to stamp out the two-year-old affection known as "grosse vèrole;" and Pintor (Thèse de Paris, 1863) cites Chinchilla as his authority for the fact that, in March, 1494, after the entrance of the sun into Aries, Rome was devastated by a syphilitic outbreak. From various accounts extant it appears that the first appearance of the malady was in the south-west of Europe, and that it spread rapidly and pandemically over the Continent and insular kingdoms (Haeser. - iii., 252). Accumulated evidence also points to the probability that France was the starting point of the affection, some time between 1488 and 1492, it being a significant fact that the oldest designation of the disease, morbus gallicus, was widely current in subsequent times, and is still met with in many countries outside Europe. About the year 1493 it appeared in Spain, and in Italy the following year. Germany and Switzerland were invaded in 1495 and 1496 respectively; it was seen in Denmark in 1496, in England in the same year, and in Scotland twelve months later. The extent of syphilis in various countries, or the number of persons afflicted thereby is variously

stated; Sabellicus (Cited in the Aphrodisiacus of Lusinus, Append. ed Gruner, Jena, 1789, p.116) says that at least one-twentieth of the population were attacked. It is difficult to determine also the duration of the epidemic; in some places the affection is said to have become extinct as early as the commencement of the sixteenth century, but at others not until twenty years later. Be that as it may, it seems certain that by 1530-1540 the malady had everywhere lost its epidemic character, and assumed the usual character and severity in which it is nowadays observed. From the various accounts it is clear that, commencing with the expedition against Naples on the part of the French, the new and appalling disease in question made its appearance for the first time in Italy, the soldiers of the besieging army being terribly afflicted thereby, and some of the children at birth showing signs of a parental taint. Syphilis, attacking the above-mentioned army of Charles VIII. of France, found circumstances eminently favourable for its development, so that an incredible virulence was by it soon attained. As stated, enormous numbers of people were affected; while the deaths were relatively few and the cures practically nil. The prevailing war, the absence of a known cure, and the laxity of public morals then obtaining were in all probability responsible for remarkable virulence observed, the latter being also fostered by the tremendous heat of the time. There are numerous descriptions of the malady extant, - e.g., Grundbeck (De Pestilentia Scorra sive Mala de Franzos, [illegible], 1497); Catanèe (De Morbo Gallico, 1505), and many others cited by Astruc (loc. cit., pp.113,122), - and from these Frascator (De Moribus Contagiosis, Venetiis, 1546, Lib.ii.Ci.) has compiled an excellent description, which is sufficiently important to bear partial quotation; "In some person," he says, "the disease commenced without contagion; in others, and these were the greater number, it was transmitted by contagion. Not every kind of contact sufficed for producing it; it required that two bodies should become heated together, as occurs in the act of coition. And it was chiefly by coition that the greater number became infected. However, a considerable number of children contracted the disease by sucking their diseased mothers or nurses. The disease was not communicable at a distance; it did not show itself immediately, but sometimes at the age of one, two or even four months; certain signs, however, announced that the disease was in the germ. Those affected were sad, weary, and cast-down; they were pale; most of them had sores on the genital organs, ulcers which are similar to those which are wont to develop themselves on those organs after coition, and which are called caries, but of a very different nature; they were obstinate. When they were cured in one place, they appeared in another, and the treatment had to be re-commenced. Afterwards, pustules arose on the skin, covered with a crust; in others they appeared elsewhere. At first they were small; afterwards they increased to

the size of an acorn, which they resembled in shape, their appearance otherwise being similar to the crusta lactea of children. In some places the pustules were small and dry. In others they were large and moist; in some livid; in others whitish and rather pale; in others hard and reddish. They always broke in a few days, and constantly discharged an incredible quantity of stinking matter as soon as open; they were so many true phagedaenic ulcers, which destroyed not only the flesh, but even the bones. Those attacked in the upper parts of the body suffered from malignant affections, which eat away sometimes the palate, sometimes the fauces, sometimes the larynx, sometimes the tonsils; some lost the lips, others the nose, others all the genital organs. Many had gummy tumours on the limbs, which disfigured them, and were often the size of an egg, or of a small loaf; when they broke, a kind of white mucilaginous fluid flowed from them. They attacked chiefly the arms and legs; sometimes they remained callous until death. But, as if all this were not sufficient, there ensued, moreover, severe pain in the limbs, often at the same time with the pustules; sometimes before sometimes after them. These pains, which were persistent and unbearable, were chiefly felt in the night, and were seated in the limbs themselves, and in the nerves rather than in the joints; some, however, had pustules without the pains, others pains without the pustules; most had pustules and pains. However, all the limbs were in a languid condition; the patients were wane and emaciated, without appetite, sleepless, always melancholy and ill-humoured, and anxious to remain in bed. Their faces and legs were swelled, and a slow fever sometimes supervened, but rarely. Some suffered pains in the head, which were persistent, and did not yield to any remedy. If blood was drawn, it was found to be pure, and somewhat mucous; the urine was thick and red; by this sign alone, supervening in the absence of fever, the disease might be recognised; the stools were liquid and mucous. Such were the symptoms of the disease at its commencement; but I speak of a past time, for now, although the disease is still prevalent, it nevertheless appears to differ from what it was then. We have seen, during the last twenty years, fewer pustules and more gummy tumours, which is the reverse of what was observed in the first years. The pustules, when they appear, are drier, and the pains, when they supervene, more severe. Within about six years the disease has again changed notably; we now see pustules in but very few patients; scarcely any pains, or much slighter ones, but many gummy tumours. A circumstance which has astonished everybody is the falling off of the hair of the head and other parts of the body, which produces a ridiculous appearance; some have no beard, some no eyebrows, some are bald. At first these results were attributed to the remedies, especially to mercury. Now it is still worse; in many the teeth become loose, and in many they even fall out." This vivid picture gives a tolerably accurate, though perhaps a trifle exaggerated idea of

the principal phenomena of syphilis, which by the time he wrote was beginning to lose much of its intensity. Other writers dwell on the occurrence of condylomata, scaly and destructive tubercular skin eruptions, deforming lesions of the mouth, throat, and nose, and lesions of the skull and bones of the extremities, attended by excruciating nocturnal pains, as well as ocular affections not infrequently causing total blindness. Some of the writers of this period refer to affections of the internal organs, though they refrain from discussing their nature; others mention that the disease lasted from several months to as many years, and that incurable chronicity was after repeated acute attacks not infrequently observed, a perfect cure being seldom effected, and a slow or sudden death the usual outcome of the attack. In the very places where the epidemic had exhibited a maximum of severity it began to subside and assume an endemic location towards the middle or the end of the sixteenth century. Although numerous writers date the appearance of syphilis to the famous epidemic just described, it is nonetheless true that the disease was prevalent in Europe prior to that, though it was impossible to say to what extent. There were at the time numerous fostering circumstances which led to an increase in the affection both in its area of prevalence and in its intensity, and gave it the widespread character of a real epidemic. Thus, for several years in succession bad weather and floods prevailed over large parts of Italy, France and Germany, accompanied by bad harvests and famine over a large part of Europe - the acme of all these social troubles being seen in the syphilitic years 1491-95. Severe pestilences, especially plague and typhus, had overrun the south and west of Europe in disastrous epidemics. The corruption of morals had at the same time reached a height which, historians affirmed, had never been equalled in ancient times. To all these unfortunate circumstances there was added the turmoil of war, which spared no country in Europe, and not only contributed largely to the upsetting of the community, but also gave syphilis an excellent chance to spread unchecked. It was especially the army of mercenaries of Charles VIII's army returning from Italy relaxed by licentiousness, broken up into lawless bands and over-running France, Switzerland, the Netherlands, and Germany, which carried with them the germ of syphilis over the whole country wherever their adventurous aspirations led them. But the disease must have acquired a still wider range and a greater malignancy than those circumstances gave it, for the reason that physicians were as yet unacquainted with its nature, their attention being first called to its distinctive characters by the general diffusion which it then reached. So much was this the case that it was regarded by them as a disease of new origin, and was attacked at first with the crude therapeutic armament bequeathed by Galen and Avicenna. It was the class of low debauchees, the loafers and tipplers, and those sections of the community most poor and most miserable, that most often fell victims to the

disease, though not a few of the better class suffered also. In time, however, the affection was overcome by improved treatment and hygienic and general management.

The epidemic character of syphilis lost after the great pandemic manifestation of the fifteenth century now and then subsequently reappeared at places in the form of epidemics; of such outbreaks there are several recorded, and the more important of their number may now be considered. The SIBBENS (or Sewens) was a disease which occurred in Scotland about the middle of the seventeenth century, particularly in the counties of Galloway, Wigton, Dumfries, Ayr, and Kirkcudbright, where, from 1694, it continued to prevail down to the second or fourth decade of last century, as is apparent from the account of sixty cases of the affection being during the twenty years named admitted to the Glasgow Infirmary from those districts and elsewhere. The troops of Cromwell are said to have imported it; and it then became endemic amongst the poor, filthy and neglected inhabitants of certain localities, being communicated by means of drinking-cups, towels, suckling, by sleeping with an infected person, by wearing the garments of the infected, by sexual intercourse, and by heredity. The names swinn, sibbens, or sewens were given to the malady from the supposed resemblance of the excrescences to the fruit of the wild raspberry of the country, called, in the Celtic language "swin." The disease was well known to be both contagious and hereditary, and it seems to have presented itself in the form of buboes, nodes, ulcers with a predilection for the throat, the mouth and the genital and anal regions - all such lesions being curable with mercury. The various descriptions extant convince us that the disease was really syphilis in a very severe form, with framboesia-like excrescences or spongy exanthems on the skin.

In 1497 syphilis seemed to concentrate its prevalence in the north of Scotland - so much so that, on the 21st. of April of that year the Town Council of ABERDEEN issued the following regulation: "The said day it was stated and ordanit by the Alderman and Consale (Council) for the eschewin of the infirmitey cumm out of France and strange pairts, that all licht women be chargit and ordanit to decist fra thai vices and syne of venerie and all their buthes and housis skalit, and thai to pass and wirk for thar sustentacioun, under the payne of ane key of hot yrne on their cheekis and banysene of the toune." (Alexander Duncan. - Memorials of the Faculty of Physicians and Surgeons of Glasgow, 1896). This perhaps the earliest notice of the prevalence of the disease in Scotland. The earliest reference to syphilis in Glasgow is to be found in the accounts of the Lord High Treasurer of Scotland, which state (1498-1498) that King James IV. made certain payments to individuals afflicted with the disease. The affection was known in Scotland also as "Glengore" or "Granggore," the term being a corruption of the French synonym, à la

grande gorre; and six months after the Aberdeen enactment the Scottish Privy Council passed the Grangore Act, which decreed that the people of EDINBURGH who were suffering from the malady should leave the town at once and fall in upon the sands at Leith for transference on an appointed day for the island of Inchkeith.

According to Jordan)Brunno Gallici seu Luis Novae in Moravia Exortae Descriptio, Frankf.,1578,1580), Ozanam (Medical History of Epidemics,T.v.,p.277), Sporisch (Idea Medici,etc.,Frankf.,1582), Crato (Scholtz Epistol., Hanover,1610, 242), and Jeitteles (Prag. Viertljahrsschrift,lxxix.,p.49), in 1578, the town of BRÜNN was afflicted by a most alarming and deadly disease, one hundred and eighty of the townspeople being attacked in less than two or three months and a great number of others in the surrounding country. The public celebration of St. Luce's Day is said to have been-marked the commencement of the epidemic, the cause of which was referred to the waters of the public baths where the people bathed and were cupped on the same day. Only those who did so contracted the disease, which manifested itself a fortnight or four weeks after that experience. Wherever the cupping-glasses were applied to the skin there, after a period of great lassitude, inflammation and sanious ulcers made their appearance. Only certain cupping-glasses, however, out of the large number used were operative in the production of the malady. Some of the patients had their whole body covered with pustules, and in time the face became so horrible as to be absolutely unrecognisable, and this in spite of treatment with bitters, decoction of guaiacum, mineral medicaments, and dressing of the ulcers with mercury.

About the year 1720 there broke out an epidemic of syphilis in Norway and Sweden which was known as RADESYGE, or the "Bad Disorder," which has been minutely described by Hjort of Norway (Norsk Mag. f. Laegevidensk, 1840,i.,1), Kjerrulf (Hygeia,1847,xii., 173) and Magnus Huss (Om Sverges Endem. Sjukdom., Stockh.,1852,10,33,43) of Sweden as well as such other observers as Charlton (Edin.Med.& Surg. Jour.1837,July, 101), Boecker (Ibid.,1809,Oct.,420), Mangor(Underrtning om Radesyge Kjendetegn,1793), Pfefferkorn (Ueber die Norwegische Radesyge,Altona,1797), Vought (Observ. in Exanthema Arcticum Vulgo Radesyge Dictum, Gryph.,1811), Holst (The Disease known as Radesyge, Christiania,1817), and Boeck of Christiania (Treatise on Radesyge, 1860). It appears that in 1758 Bonnenie was ordered to Egersund and Stavanger to inquire into the prevalence of a new affection there, one that prior to 1710 had never been heard of, its first appearance being referred to the crew of a Russian ship which wintered at the latter town. Two Norwegian women visited the vessel and a few weeks afterwards were unable to move about owing to the severity of the ulcers which developed upon their external genitals, their throats and other parts of their anatomy being also affected. The natives looked upon it as a foul disease and therefore gave it the above-mentioned name. The affection continued to spread

until its acme was attained in 1760, and by the end of the same century it was prevalent in all parts of Norway, but mostly along the coast of the Bergen and Christiansand departments, special hospitals having to be provided for the treatment of the very many cases reported each day. The malady seems to have first appeared in Sweden in 1762, on the occasion of the return of the national troops from the Seven Years' War, the latter having therefore an etiological relationship to its occurrence. Twenty-eight years later the troops were responsible for another outbreak of the disease, when they returned from their campaign in Finland. Since then the affection has continued more or less endemically in certain places, particularly about Lahne, Crust and Tjörn. Despite the opinion of Cron to the contrary radesyge was the same disease as the Scottish sibbens, namely, a severe form of syphilis amenable to the influence of mercury and having well-recognised specific symptoms. It affected chiefly the poorer inhabitants of neglected districts and the dwellers in the slums of the towns, and was spread by personal contact and heredity. Some of the writers of the time contended that there were two forms of affection: one which is spedalsked, the other radesyge, properly so called. In view of the confusion with spedalsked, or leprosy, the disease was for a long time not properly understood; and it remained for Hebra to establish the distinction. The patients suffered from severe cephalalgia and pains in the extremities, particularly during the night, herpetic eruptions in the forehead, chest shoulders, and arms, as well as a certain amount of sore-throat. The skin eruption gradually spread and acquired an elevated margin. It first appeared on the face, in patches, at first superficial, which gradually became deeper; subcutaneous tubercles were formed, which passed into a state of inflammation and suppuration. The inflammation of the throat increased, the tonsils and uvula showed ulceration which extended to the pharynx; similar ulcers appeared in the region of the palate, and the bones of the latter were attacked and destroyed. On the limbs there appeared ulcers with dark-red margins, sometimes covered with a thick dry crust. On the genitals, anus, and perineum condylomata and excrescences developed which gradually extended to the thighs. The disease attacked the septum of the nose, which ulcerated and became in time perforated; there was decay of the bones, especially those of the limbs and the forehead; and tophi and exostoses were sometimes observed, which soon changed to caries. The affection was amenable to mercury, and was believed to originate in infection by the saliva, the perspiration and watery discharge from wounds and sores, as well as garments and culinary utensils.

Another, at one time little-understood, affection which was undoubtedly syphilitis was PIAN, also known as yaws and Framboesia according to the country in which it prevailed. The Arabs in the tenth century observed it and christened it Sahafati; and the earliest accurate

description of its phenomena we owe to Pison (De Medicina Brasilensi,Lib.ii.,C.xiv.,1648) who gave it very close study. It is chiefly found amongst negroes, both in tropical Africa and the other countries to which they have been imported (South America, etc.), as well as the Indians of South America and of the Antilles, though seldom amongst the mulattoes, creoles, and the coloured people of the north and east of America and white people amongst whom they reside. The affection commences with a feeling of hebetude and weakness, pains in the joints, and fever, especially in children. After infection there appear in the different parts of the body, in pian, little red pimples; in yaws, papules and pustules, which soon become covered with uneven crusts, beneath which there are more or less extensive ulcers. These ulcers, which coexist with large tubercles, to which latter is due the name of yaws, are sometimes raised, bleed at the slightest touch, and are followed by a scar. Wandering osteocopic pains, exostoses, and various other bone troubles are seen in pian. In these and the multitudinous other symptoms we find an analogy to syphilis; but what proves above all the identity of the nature of the same and the necessity for grouping them together is their method of distribution. Pian resembles syphilis in being contagious, and various authors give striking illustrations of this. The affection can also be inoculated, as numerous cases in the literature amply prove. It can also be propagated by heredity, and the general clinical features of the disease markedly resemble those of syphilis as now observed.

Under the name of JUTLAND SYPHILOID has been described another classical epidemic of syphilis. Deurs (Jour.f.Med. & Chir., June, 1835), by reason of the rarity of gonorrhoea amongst the people of Jutland whom he examined, maintained that the affection was different from true syphilis, and classed it as a syphilis insontium, - syphilis of the innocent, - and for the simple reason that it was mainly transmitted by clothing, bedding, and drinking-cups. On the other hand, Hassing (Rollet's Researches on Syphilis,p.108) insists that it is a true syphilis, though he admits that there is great difficulty in determining the real cause of the affection, owing to the natural disposition of the patients to blame almost anything else than sexual intercourse for its origination. Its identity with syphilis is now generally admitted; and it appears that the affection became epidemic through Russian sailors, or through the troops from Sweden or Norway, in the middle of the eighteenth century. It prevailed mainly in the northern part of Jutland, and now and then cases are still observed. The first efforts to stamp it out were taken by the Danish government in 1817, Deurs taking a prominent part in their operations.

A similar epidemic appeared in Holstein about the year 1762, and the affection received the name of DITHMARSIAN, or the Holstein Disease (Brandis. - Bibl. f.Laeger,1813). It is said to have arisen through a large number of foreign navvies, chiefly from East

Friesland, crowding into the Süder-Ditmarschen for the purpose of working at the construction of the Crown-Prince dyke. The disease became widespread throughout the marshes and the Cheese, so that in certain villages none of the population was spared. At the end of the century other parts of Holstein were attacked, and it became necessary in 1801 for the government to interfere. Five years afterwards the affection became almost pandemic, and even reached Kiel, where and elsewhere it raged until the end of the fourth decade of last century, afterwards subsiding into the occasional form in which it is there still observed.

Bontius (Medicina Indorum,1718), in his work on Indian Medicine, refers to a disease known as AMBOYNA PIMPLE, which was observed in the island of Amboyna, where and at the Molucca Island many of the inhabitants suffered with tophi, hard and margin-raised ulcers, and caries of the bone. In most respects it resembled syphilis, but had the important difference, it was said, of not being transmitted necessarily by sexual intercourse. In view of the unreliable nature of our author's evidence on this point and the cure of the affection by mercury, no one doubts that syphilis was the malady to which he refers.

The DISEASE OF SAINT EUPHEMIA, or Syphilitic Herpes, is an affection which, according to Jean Bayer (Acta Nat.Cut.,T.iii.,p.4) and Ozanam (Treatise on Epidemics,1823) occurred in epidemic form in the month of March, 1727. It appears that a midwife of Saint Euphemia had on the index finger of her right hand a pustule which caused intolerable itching. The affected part soon swelled, and the whole body became covered with an herpetic eruption. The pustule on the finger continued for four months, and the patient, who continued to attend confinements as usual, gave the disease to more than fifty pregnant women whom she either delivered or examined. One of the local physicians found similar ulcers in the vulva of several of these women. During this time the disease spread to the children whom their mothers were suckling, and to their husbands, to such an extent that in four months more than eighty persons were infected. The practice of the offending midwife was stopped. The bodies of those affected became covered with pustules and ulcers, or with hard tubercles and other syphilitic lesions. That it was syphilis is certain, and it is interesting to note the great severity of the disease as arising from extragenial infection.

In the month of June, 1752, an affection after the style of the foregoing broke out in epidemic form at Nèrac, the PIAN in question originating through the suckling of a syphilitic infant. It appears (Raulin.-Observations in Medicine,1764,p.250) that one of the merchant's wives, who had been confined in the beginning of November of the preceding year, had her child suckled for six months by a wet-nurse; the latter became ill and handed the infant to another nurse who also fell sick, and the child was handed in turn to

several other nurses, all of whom developed pustules on the breasts and subsequently over the rest of the body, the children of these wet-nurses being also affected in the same way. In this way, by the end of the year, about fifty persons of both sexes showed signs of the disease.

A very malignant epidemic of syphilis was the SYPHILOID OF LITHUNIA AND COURTLAND, which was observed in 1757 after the invasion of the Russian soldiers during the Seven Years' War. According to Thèden (Erfahrungen aus der Wunderzeneikunst,&c.,Berlin,1782, iii.,9), it lasted until the year 1820 and became stamped out through police supervision and the usual medicaments judiciously applied. In Courtland the landing of the Russian soldiers on the Dondanga Coast caused its first appearance in the first year of the last century, where, according to Adelmann (Med.Zeit. Russl.,1844,No.43),it prevailed until 1844.

The SYPHILOID OF CANADA made its appearance amongst the inhabitants of the banks of Lake Huron in the year 1760; and in 1780 it was observed at St. Paul's Bay, from which it spread rapidly over a large part of Canada and to such Indian tribes as the Otowa. Five years afterwards there were about six thousand people suffering from the disease. Swediaur (Practical Observations on Venereal Complaints,Edin.,1788,172) tells us that it manifested itself by the development of small pustules on the lips, tongue, and buccal mucous membrane, the sexual organs being comparatively seldom attacked. Bedclothes, garments, etc., infected with the pale puriform discharge therefrom rapidly spread the disease to others; and in the course of its evolution, in persons of all ages, - particularly children, - there were noticed tubercular deposits, nocturnal osseous pains, oral and pharyngeal ulcers, suppurating or non-suppurating or hard and indolent glandular enlargements, caries of the nasal and palate and cranial bones, alopecia, thoracic pains, cough, anorexia, and so forth - all symptoms pointing to its true syphilitic nature.

FALCIDINA was first observed in the district of Agordo at Falcado in the year 1786, from which it spread to other villages in the Tyrol, particularly Fassa and Manzon, and died out twenty-eight years later. Zecchinelli(Ann.Univ.di Med.,1820,335), Valenzasca (Della Falcadina, 1840), and others say that this syphilitic affection was imported by a gipsy woman with venereal itch, warts and ulcers on the genitals. In spite of its amenability to mercury, very many persons were attacked, particularly the newly-married and children, the main clinical phenomena being exostoses, osteocopic pains,serpiginous ulcerations of the neck and shoulders, and gummata.

Another famous epidemic of syphilis prevailed on the coast of Croatia and Dalmatia in the last year of the eighteenth century, where it was specially described by Boué (Essay on Scherlievo,1814), Cambieri (Ann.Univ. di Med.,1819,273), Jennicker (Oest. med. Jahr.,1819-20, H.v.,3,104), Lorenzutti (Del Male di Scerlievo,Padua,1830),

Sperer (Oest.med.Jahr.,1831,N.F.ii.,211), Michahelles (Das Male di Scerlievo,Nurenb.1833), Moulon (New Observations on the Nature of Scherlievo,Milan,1834), and others under the name SCHERLIEVO which was commonly given to it. These authors tell us that the affection was imported into the village of Draga near Fiume, that the first woman to become infected being a prostitute called Margaretta, - hence the name Margaritizza sometimes given to the disease, - who gave it to many others and was indirectly responsible for the great epidemic observed. From this village it spread to Scherlievo, Proputnik, Kukulionovo,Buccari, and Novi; and it was not long before the people of Grobnick, Senosich, Schnaberg, Wipach, Adelsberg, and other places were in large numbers attacked. Most of the cases reported were undoubtedly of a syphilitic nature, though not a few were instances of scurvy, scrofula, cancer and other simulating diseases. The malady appears to have manifested itself on the skin in the form of malignant pustules, proceeding to ulceration and caries of the bones, with destructive lesions of the tongue, ears, and genitals. It imitated the other epidemics already described in being accompanied by osteocopic pains and articular pangs, with ultimately tubercles and ulcerations of the skin and throat and much constitutional disturbance. Numerous children were attacked; and in their case there occurred, particularly on the buttocks and groins and inner aspect of the thighs and abdominal wall, a dull-red erythematous eruption. It was propagated by sexual intercourse, drinking-utensils, clothing, and so forth, as well as by heredity; and it was only after fifty-five years of strict police sanitary supervision that the affection died out.

Of the same nature were the various local endemic affections known as MAL DI BRENO (Sigmund. - Zeit. der Wiener Aerzte, 1855,i.,87), - FRENGA (Sigmund. - loc. cit., p.33), - prevalent in Servia, Wallachia, Moldavia, and Bulgaria, - BOALA,SYPHILOID OF HESSE (Rothamel. - Zeit.f.d.Gesammte Heilk.,i.,15), SPIROKOLON , - in Greece, - YANG-MEY-TCHOANG (Dabry. - The Medicine of the Chinese, Paris, 1863,p.163), in China, - the CRIMEAN LEPRA (Martius. - Diss.Inaug.de Lepra Taurica, Leips.,1815), and the KABYLE DISEASE (Arnould. - The Kabyle Lepra,Paris,1862).

About the year 1815, the commune of Chavanne was visited by a syphilitic epidemic which received the name of the CHAVANNE DISEASE (Flamand. - Jorun.Compl. du Dict. des Sci. Méd., 1819,v.,134), being there imported by the Austrian troops. In a little over two years the entire district was covered. The affection was also observed in Bohemia and Capistrello (Streinz.- Oest.med.Jahr.,1831,N.F.,ii.,256; Selli.- Ann.du.Derm.et de la Syphiligr.,1869,i.,158), where, as elsewhere, the neglect of public hygienic precautions and laxity of morals were blamed for its spread.

From the history of the above-described epidemics we may take it that syphilis occurred in Europe and various other parts from the earliest times; that the affection spread over a large part of Europe towards

the end of the fifteenth century in the style of an epidemic, when it attracted the attention of medical men for the first time and was first recognised by its peculiar features; that after the extinction of that epidemic, which lasted about thirty years, the disease fell again to its former level; that it was imported from Europe to other parts of the world through the instrumentality of international commercial relations; and that there are apparently at the present time some isolated and little-visited localities in which it has never obtained a definite establishment. In the propagation of syphilis the discovery of America by Columbus received a large share of blame for the propagation of the disease in Europe, the Indians having, according to Schaums (Aphrodisiacus,i.,383), for many years suffered from syphilis, though he seemed inclined to blame the weather for many of the cases observed elsewhere, For long the controversy on the alleged American origin of syphilis was waged, and without any very definite conclusion being derived therefrom. From the sixteenth to the nineteenth century little real advance was made in our knowledge of syphilis, syphilis, chancroids and gonorrhoea being classed as one and the same disease; it remained for Ricord (Practical Treatise on Venereal Diseases, 1838) to point out the important distinctions. It must be noted, however, that in 1767 Balfour (Diss d. Gonorrhoea Virulenta, Edin.1767) did his best to establish their non-identity; but his information fell on deaf ears, since so great an authority as John Hunter(Palmer Edition of his Works, 1835,p.143), supported by what he thought convincing experiments, in 1787, decided against him and claimed the identity of these miscellaneous veneral affections as proven. Differences in the manifestations of the disease he referred solely to differences in locality, on mucous membranes the virus producing a gonorrhoea, on the skin a syphilitic ulceration. Ricord (loc. cit.), as stated, finally determined the mooted point in 1831. He made hundreds of inoculations of the skin with gonorrhoeal pus, and on no occasion could he find any syphilitic manifestations arising therefrom. This was an important advance in nosology; and the findings of others to the contrary he explained by supposing that in their case a chancre had been concealed within the urethra. In this was gonorrhoea was finally eliminated from the definition of syphilis, the latter term being limited to ulceration and certain other diseased processes upon the genitals and to those symptoms called, after Hunter's time, constitutional. The well-known essay by Virchow on "The Nature of Constitutional Syphilis" also did much to lay the foundation of our modern ideas concerning the disease. In 1879 Neisser discovered the gonococcus, and so gained a triumph for the dualist school. All that remained to be proven now was the origination of soft sores, or chancroids, in a specific microorganism; and the hopes of the interested were realised in 1889-92 when Ducrey and Unna isolated the bacillus of that simulating disease. After numerous failures, the casual agent of syphilis was, in 1903-06, discovered by

Hoffmann and Schaudinn, Metchnikoff, in 1903, also taking a prominent place in painstaking research to that end.

E T I O L O G Y .

GEOGRAPHICAL LOCATION.

Syphilis is of world-wide prevalence nowadays on account of the active intercourse which is maintained commercially between different countries. But the affection is still to be found principally at the great centres of traffic and social prosperity, from which the malady is constantly being carried to other and comparatively isolated localities. This is particularly true as regards the great seaports throughout the world. It so happens, then, that in not a few countries the coast is invaded before the inland districts; and such circumstances as these are responsible for the development of the disease less readily in one place than another, its propagation being mainly ascribable to the mode of life, manners and customs, national temperament, and the grade of civilisation of the locality concerned. No race seems to have an immunity to the disease; so that it strikes one as peculiar that syphilis has made comparatively little progress in certain countries in which the inhabitants have had the opportunity of acquiring it. ICELAND is an instance often cited, and the same is true of the FAROE ISLAND. Mackenzie (Voyage to Iceland and Greenland during the Years 1835-36 in the Corvette "La Recherche," Paris,1851,p.42), at the beginning of last century affirmed that the disease could scarcely be said to exist in Iceland, and that, though syphilis sometimes occurred through communication with foreigners, the affection was invariably intercepted before it was able to gain a footing in the country. In this he is confirmed by the practitioners of the country who tell us that they have frequently treated syphilis amongst the sailors of merchant vessels, but seldom or never amongst the inhabitants themselves. This desire to prove syphilis foreign to the country is, if substantiated in fact, all the more strange as there arrive every year in that country numerous Danish merchant vessels, the sailors of which have intimate relations with the natives in the summer; and, moreover, the island is every year touched by many French and Dutch and other fishing vessels, whose crews as often as not visit various ports. There is not the slightest doubt, then, that syphilis has been on innumerable occasions introduced into Iceland, though it seems signally to have failed to secure a firm footing there. Local records state that at one time (1756) syphilis was not infrequently observed in the vicinity of the wool-factory at Rejkiawicth, and that it took eighteen years to stamp it out. In 1824 the Danish sailors imported syphilis, 17 cases being in that year observed in Nordland, and 5 the next year at two farms, after which the affection died out. In more recent years travellers have testified to the exceeding rarity of syphilis in that

country, and attribute this more to the correct morality of the islanders than to the rigours of the climate. Panum (Bibl.f.Laeger,1847,1.,p.316) says that in the Faroe Islands the affection was unheard of until the year 1844, when it broke out and lasted for two years, during which time about a score of cases were observed. Syphilis is found in varying degrees of frequency and severity throughout the rest of Europe, though it is difficult to determine, statistically or otherwise, the relative frequency of the affection in a given nation or a given locality; for most of the cases are not registered as they are not treated in hospitals or other institutions where such is undertaken. In the BRITISH ISLES syphilis is very common, as it is also in DENMARK, NORWAY, GERMANY, FRANCE, AUSTRIA, ITALY, SPAIN, PORTUGAL, etc:, in which countries the differences in the amount of the disease are largely influenced at various points by the local conditions, such as the erotic and loose existence of the great cities, the great development of commerce, active social intercourse, and position in the coast. The distribution of syphilis would appear to be most extensive in Great Britain (especially amongst the military), Norway, Sweden, Italy, Sicily, and Turkey. The statistical compilations of the British Army are useful for estimation of the frequency of the disease amongst this class, and make interesting material for comparison with the military returns of other countries. According to the Army Statistical Report for the British Army for 1860, syphilis (and other venereal diseases) caused, in the home army a loss of eight (and a fraction) days of service per man, while, two years later a loss of less than a half (3.90) was returned in the French Army. The various returns all go to prove that the proportion of syphilitics to the sick are considerable; and in the case of our own troops it is, according to the army surgeons, alarming. The amount of syphilis amongst the troops would appear to give a tolerable idea of the prevalence of the disease in the various localities which they concern; and they show that syphilis is less frequent in Belgium than in France, and in the latter than in Great Britain. According to the "Medical Statistics of the Army during the Year 1892" (Paris, 1864), to less than 2,999 cases of constitutional syphilis were reported amongst 316,578 men, exclusive of 21,595 cases of chancre. The statistics are larger than others from Holland, Belgium, Spain and Portugal, in which countries, however, the disease is very frequently observed, even in the interior. During the period 1860-69, there were 236 admissions per 1000 men; and for other countries' armies the figures were - Italy, 1864-65, 120; Bavaria,1857-69, 116; France,1862-69,106; Holland, same period,105; Belgium,1858-60,100; Portugal, 1861-67,96; Austria,1869,63; and Prussia,1867,54 admissions per 1000 men (British Army Report for the Year,1879; Sormani. - Geogr.Nosol.d.Italia,Rome,1881, 226; Rothmund. - Bayr.Aerzt.Intellig.,1872,No.23; Laveran,-Treatise on Army Diseases,Paris,1875,446; Granier. - Lyon Méd.,1880,No.18,1; Vleminkz. - Gaz.Méd. de Paris,1862,445). There is to be found a good deal of syphilis in the seaport towns of the Mediterranean

coast; and numerous observers have remarked upon the prevalence of the disease in Southern ITALY and SICILY in contrast to the northern and central portions of that peninsula; and Sormani (loc. cit., p.104) states that in the Italian Army from 1874-76, while syphilitic cases averages 56 per 1000 amongst the troops in the northern and central military divisions, it rose to 88 in the southern division and to 78 in Sicily. Nowadays the disease is just as common there as in Great Britain, the mortality varying in the peninsula from 64 to 78 per 1,000,000 living in the years 1887-96. The enormous prevalence of syphilis noticed in ROUMANIA in former times by Blaustein (Allg.Zeit.f.Chir.,1842, No.49) and Barasch (Wien.med.Woch.,1855,No.49) was later confirmed by Leconte (Considerations on the Pathology of the Province of the Lower Danube,Montp.,1869) and Champouillon (Mém.de. Méd.Milit.,1868,xix.,177), the latter affirming that syphilis prevails amongst a large part of the population, both old and young and urban and rural. As regards its present distribution there, this also applies after deducting a little for exaggeration. Syphilis is a very common disease in TURKEY IN EUROPE, it being largely propagated by the troops returning from the capital to their homes, Constantinople being therefore the central focus for the infection of TURKEY IN ASIA, and ASIA MINOR as well. The occurrence of the disease in MONTENEGRO is referred to importation by the Montenegrin emigrants returning from Constantinople for places west thereof after contracting the malady. In GREECE syphilis is a well-known affection, particularly in the northern part, where it is known as spirokolon and as a very severe and intractable ailment. Syphilis is one of the commonest diseases of RUSSIA, particularly in the Baltic provinces, the Ukraine, the governments of Viatka, Samara, and Astrakan, and the Kirghiz Steppe, as well as FINLAND, though in LAPLAND the disease is very rare. In many parts of Russia, besides those mentioned, syphilis assumes the intensity and frequency of a veritable scourge. According to the "Report of the Conference on Syphilis, Held in St. Petersburg by Imperial Command in 1897" (St. Petersburg.1897), the proportion of population in the different governments of European Russia treated for syphilis, in 1889-94, varied between 700 and 10,300 per 1,000,000 inhabitants. These figures, it would seem, are vastly underestimated.

Various countries in ASIA suffer severely from syphilis. It is widely prevalent in the CAUCASUS and TRANSCAUCASIA, where, according to reports, the Russians are more severely affected than the natives of the soil. On the other hand the disease is comparatively seldom observed in the country to the north of the Caspian Sea, in the valley of the Ural River, and among the Bashkir and other Tartar tribes on the borders of European and Asiatic Russia. In former times it used to be more prevalent there than now, its present occurrence being ascribed to the return of the younger members of the populace from the Russian towns wherein they have temporarily resided. The Bashkirs are gener-

erally regarded as a very moral people, which one can well believe, knowing the great infrequency of prostitution amongst them; and the same is true of the Kirghiz hordes. It is difficult to obtain satisfactory and reliable information regarding the prevalence of syphilis in CENTRAL ASIATIC RUSSIA and SIBERIA; but from what we know of the rest of the Russian Empire it is reasonable to suppose that syphilis is a very common affection of all classes of the community, with the exception of certain very isolated parts perhaps. Thus, it appears that there is very little syphilis amongst several of the gold and other mines in the Yakutsk government and in the Amur and Transbaikal provinces; and for many years, we are told, not a single case has been seen in some of the mines in the Kirghiz steppes of Semipalatinsk and Semiretchinsk. On the other hand syphilis is particularly common amongst some of the aboriginal Siberian inhabitants, such as the Samoyeds, Yakuts, Tunguses, and Buriats. Numerous parts of CENTRAL ASIA are well acquainted with the disease. It occurs, for instance, all over BOKHARA in a far severer form than in other countries, owing to the absence of treatment. Syphilis is as generally distributed in ASIA MINOR and SYRIA as in the other localities mentioned, and it is said to be particularly common in ARMENIA, especially on the high tablelands (Wagner. - Reise nach dem Ararat, Stuttgard,1848). After it was carried in former times into the mountains of Syria by the troops of Ibrahim-Pacha, it became common, according to Robertson (Edin.Med.Jour.,lix., 247), in the plains of that country; and Tobler (Beitr. z.med.Topogr.von Jerusalem,Berlin,1856,p.56) tells us that it was not long in extending into PALESTINE. Pruner (Die Krankh.des Orients,p.179) says that in ARABIA the disease is seldom seen outside the seaports, Djedda being quite a hotbed of the ailment. Though in the south and in the interior of the country syphilis is unknown, it is common in the tribe of the Schellouks and on the banks of the White River. Syphilis is now not at all so rare as formerly (and at Basra, at the head of the Persian Gulf, it is quite common) in PERSIA. Various authorities testify to the former and present extreme frequency of syphilis in INDIA, certain parts of the country being notorious in this respect; thus, KASHMIR finds in syphilis the greatest scourge imaginable, and the disease is seen largely amongst most of the tribes on the southern slopes of the Himalayas. According to Carleton (Trans. First Indian Med. Congress,1894), during the last three decades or so not 5 per cent of the population in the Simla Division have escaped the ravages of the disease. Syphilis is very common in Rajputana and in most of the villages in the Hindu-Khush. Some observers have stated that a third of the hospital patients in India are syphilitic; and Edmonds (Madras Quart.Med.Jour.,i., 248,260;iii.,13.31) estimates that the average number of syphilitic cases annually amongst the troops in India at 12.16 per cent. for Europeans, and 3.18 per cent. amongst the natives. Kinnis (Edin.Med. & Surg.Jour., lxxv.,302) tells us that in the Bombay Presidency

syphilis is of appalling severity and that, in conjunction with other venereal affections, it furnishes a sixth part of the hospital admissions, swells the morbidity list, deprives the army of strong and efficient men, and undermines the constitution of many so much as to render them utterly unfit for the defence of their country. The Indian troops are said to be probably more syphilitic than any others in the world; authorities are becoming more and more alarmed and the public demand is for a more stringent supervision and prophylaxis than hitherto observed. The official statistical compilations during a number of years show that the cases per 1000 of the strength were, in 1871,61.2; in 1873,52.4; in 1874,68.3; 1875,67.1; in 1876,58.8; in 1877,65.2; in 1878,95.3; in 1879,79.2; in 1880,87.9; in 1881,92; in 1882,87.6; in 1883,87.2; in 1884,90.2; in 1885,122.1; in 1886,157.9; in 1887, 142.1; in 1888,142.1; in 1889,225.1;in 1890,220.7; in 1891,159.2; in 1892,161.1; in 1893,213.6; in 1894,248.1; in 1895,238; in 1896,226.4; in 1897,201.7; and,- including other veneral diseases, - in 1898, 362.9; in 1899,313.4. During the thirty years which this tabulation concerns it will be seen that syphilis is three times as common in the Indian Army now as it used to be, though the latest returns would seem to show a fall, attributable to better treatment and more careful supervision on the part of the authorities. We have seen that the native troops are less severely affected than the European, the annual number of cases amongst the former varying, since 1877, from 26 to 41 per 1000. According to Lequerrè (Some Considerations on Pondicherry and its Inhabitants, Thèse de Paris, 1837,No. 262,p.26), syphilis is comparatively infrequent, it being, as regards the women, encountered mainly amongst the lower-classes. Syphilis is not so common in CEYLON as in India; whereas in most of the EAST INDIAN ISLANDS it is a most serious disease. In BORNEO, for instance, syphilis is terribly common and causes ravages in individuals and tribes in a way almost past credence. The affection, however, is rare in JAVA. Syphilis is one of the commonest of all diseases in SINGAPORE and the STRAITS SETTLEMENTS, and the hospitals are teeming with serious cases (Medical Report for the Straits Settlements, 1898). Not less than a fifth of the total hospital admissions at SAIGON, in French Cochin China, are due to syphilis; and in SIAM, amongst the LAOS, and in TONGKING the affection is even more prevalent and severe than in former years. Syphilis is very frequently observed in COCHIN CHINA, and the hospitals of that country usually contain several cases; and Thorel (Medical Notes, etc., 1870) states that the disease is carried far into the interior of Laos by Chinese and Burmese caravans, and that the only individuals who escape it are the Anamese living in isolated settlements in the forests or in mountainous regions difficult of access. The affection is always to be found in KAMTSCHATKA, especially amongst the Koriaks and Tchoukchi, as well as the people of Petropaulovski. Syphilis seems quite as common as gonorrhoea in CHINA, particularly in the seaports and along the coast. According to

Armand (Letters on an Expedition to China and Cochin China,Gaz.Méd.,1862,677), amongst the 530 patients treated in the French military hospital of Tien-tsin, during the first six months of the year 1861, there were 90 cases of chancre and 21 of constitutional syphilitic manifestations. He tells us that syphilis, which is the first to be dreaded on landing in China, is ubiquitous in that country, and that its great frequency is in proportion to the masses of people aggregated together and to the amount of their association with foreigners. In the case of the latter, the disease is much more serious in its manifestations than amongst the natives, whose skins are seldom changed in colour by the syphilitic eruptions and appear, particularly the women, to be in good health. Some would also have it that China has, for thousands of centuries, undergone a kind of general syphilisation which has progressively attenuated the virulence of the infection in the individuals attacked. Within recent years, however, the affection seems manifesting itself in a more severe form amongst the Chinese, who, it is said, make no attempt to treat it and spread it broadcast by venereal and non-venereal means and take no pains even to conceal their afflictions from the eyes of spectators. Consequently, in certain parts the population is saturated with syphilis, and in Bakhoi (Chinese Customs Medical Reports,No.45), we have it on reliable authority the entire population is syphilised. The people of COREA seem attacked quite as frequently as the Chinese themselves are. The affection is said to be very common also in JAPAN, where it is called "the fire of lust" and prostitution abounds. Indeed, all classes of Japanese society are affected; and this has obtained for many years. The malady is, however, there comparatively mild in its manifestations; and this has been attributed by some to the mildness of the climate. It is impossible to say when syphilis was first introduced there; but it was doubtless wandering Europeans of bygone ages who did so.

AUSTRALASIA. - Both the natives and Europeans in the PHILIPPINE ISLANDS frequently suffer from syphilis; and in NEW GUINEA the affection is not infrequently observed, though in a somewhat mild form. The occurrence of the disease in MURUA is of comparatively recent date; and we are told that in the SOLOMON and NEW HEBRIDES ISLANDS the malady not infrequently assumes a great severity, though the autochthones are less severely affected. According to Guppy (The Solomon Islands and their natives, Lond.,1887), syphilis is common enough in the Solomon Islands, especially in those, such as UGI, which are in intimate contact with the outside world; in the New Hebrides, however, there is less venereal disease, and principally in the white people resident there. Syphilis seems to have been introduced into NEW ZEALAND, in 1769 and 1770, by the sailors of Captain Cook. This has been denied by some, though proved by Bouillon-Labgrange (Jour.Gén. de Méd.,i.,38), who showed that the natives were from the very first in the habit of calling the affection the "English Disease." Very soon after

its introduction in this way the disease attacked large numbers of the population, especially amongst the natives of Taiti (Wilson. - Edin.Med.& Surg.Jour.,ii., 284), but subsequently lost much of its virulence. It now there exists within quite moderate limits, and seems likely in future to die out altogether as the moral tone of the people improves. Most observers are agreed that syphilis is of comparative rarity in AUSTRALIA, at least as a cause of death and so far as the white population is concerned. But the case is different as regards the natives, amongst whom it commits great ravages and has been largely instrumental in their gradual extermination. The same is true of TASMANIA; and it appears that during the years 1821-31 Scott (Trans.Prov.M ed.Soc.,1835,iii.,12) saw only 6 cases, - which were imported, - of the affection in Hobart Town; and others since his time have testified to the rarity of venereal diseases of all sorts, that is to say, amongst the Europeans. Consequent upon the introduction of syphilis to this part of the world by Captain Cook's sailors, it rapidly spread to various islands of POLYNESIA, particularly the HAWAIIAN or SANDWICH ISLANDS and the SOCIETY ISLANDS. Lockwood (Amer.Jour.of Med. Sci.,Jan.,1846,91) says that in the first-mentioned group the disease is not so common as it used to be, being mostly observed in the seaports. It is also rare in the other groups of the islands, such as FIJI, TONGA, and SAMOA; and it appears that in NEW CALEDONIA there was no syphilis prior to the arrival of the Europeans (De Rochas. - Medical Topography of New Caledonia, Montp.,1868,22). The more or less active intercourse with other countries, and the efficiency of police supervision in the Dutch and British possessions, may be regarded as responsible for the differences in the extent and frequency of syphilis in the islands of the MALAY ARCHIPELAGO and elsewhere in this quarter. In the case of the Malay Archipelago, the disease is most severe in the large and much frequented islands of JAVA, SUMATRA, etc.; it is most commonly observed along the coasts and neighbouring districts which have relations with Europeans; while in the districts in the interior of some of the islands, syphilis is, in a sense, unknown, though now and then there has been an importation of it into the mountainous districts of the interior and a wide extension of its area. In the Malay bazaars syphilis is common enough, though exceedingly rare in the isolated districts round about. According to Steen-Bille)Medical Voyage around the World,1829,p.100), syphilis is rare in the NICOBAR ISLANDS, though frequent and severe in the MOLUCCAS, where it is more intense in its manifestations than when it appeared in Europe. The poorer classes of the Malays, it seems, are ruined by this disease, which is mainly characterised by the development of corroding ulcers in every part of the body. Within recent years, however, matters are improving under the efforts of the authorities to keep prostitution under control, especially in AMBOINA and TERNATE. The disease is very prevalent still in RIOUW-LINGCA ARCHIPELAGO and the ANDAMAN ISLANDS; and such small and isolated islands as the NICOBARS, BANKA,

BILILTON, the BANDA group, and TIMOR suffer least, owing to their being out of the course of general traffic. In some of the islands in the middle of the Pacific syphilis is said to be unknown. In PINE ISLAND chancres generally assume a phagedenic character, though secondary and tertiary affections are seldom observed.

AFRICA. - Syphilis is mainly distributed on the coast territories, to many of which it appears to have been imported from Europe; in the districts farther inland it is less commonly encountered, and in some places it is of modern or quite recent introduction; in the centre of Africa it is only seldom seen. The EAST COAST of Africa seems to be quite a hotbed for syphilis; and the same is true as regards the islands of MAURITIUS and REUNION, and of MOZAMBIQUE and ZANZIBAR, where the affection is said to attack about 90 per cent of the natives, and thus to become distributed into the interior as far as the shores of LAKE TANGANYIKA. The disease was first imported into Madagascar and the adjoining islands of St.MARIE and MAYOTTE in 1854 (Daullè . - Medical Observations in the French Establishment of Madagascar,Paris,1857), and from the first exhibited the peculiarity of being confined almost exclusively to the Hovas, who are the leaders of the people and closely allied to the Malay race, while the Malagasys, who are mainly of negro blood, showed an almost complete immunity. Borius (Arch. de Mèd. Nav., Aug.1870,109) says that, on the island of St. Marie, which is inhabited by the latter race, in spite of the general and habitual prostitution of the women, primary syphilitic affections are very rarely observed, and other venereal affections are very rarely encountered. One of the principal centres of syphilis is NUBIA, from which it has been carried by the soldiers to the districts about the northern lakes. The wide prevalence of syphilis in ABYSSINIA is well known, and the inhabitants of UGANDA and MAYUENNA suffer largely from the disease. In former times the malady was little seen in the southern lake region, but of late, owing to the more frequent communication with the coast, it has become a rather common ailment. Syphilis is said to be rare on the upper and middle ZAMBESI and in the interior of BRITISH EAST AFRICA, though commom enough on the coast. One writer (Roche. - Annal.d'Hyg.,xxx.,5) has estimated the prevalence of syphilis in such places as Abyssinia at nine-tenths of the population; and the enormous diffusion of the affection in EGYPT and NUBIA is generally admitted;it is also very common in the SOUDAN, where, especially amongst the Baggaras, - once the ruling people, but now a scattered and insignificant race, - it constitutes a hideous disease. One of the captives in the Mahdi's camp (Fr. Ohrwalder) says that the immorality of the slaves and the Baggaras is quite beyond description, though this is not the fault of the former who are in their savage state quite the reverse. The slaves learn all the vices of their masters, and are flogged if they do not participate in them, - with the result that the most loathsome forms of disease are everywhere prevalent, and so common that freedom from same is considered a degradation. At first the

Baggara were not affected to any considerable extent; but now contact with the natives of the valley of the Nile has made them so syphilitic that they are physically and morally a ruined race - a marked contrast to their former glory in the Soudan. In TUNIS syphilis is the most widespread of all contagious affections, and far and away the most serious and terrible, it reigning supreme amongst the people and rarely sparing any of them; the French troops here are particularly subject to the disease, and more so than their comrades in any other part of the world. The people of ALGIERS are very prone to syphilis, particularly since the French took possession; from there it has penetrated as far as the SAHARA and attained a maximum of severity in the districts of KABYLIA. A hideous type of the disease prevails in MOROCCO; and it appears to be very frequent in SENEGAMBIA, where it constitutes a veritable scourge amongst the natives, 206 per 1000 at one time being affected. Syphilis, as early as the beginning of the eighteenth century was widely prevalent along the WEST COAST, and especially at CONGO; and it is now quite common there, and in SIERRA LEONE and LAGOS. Untreated cases of syphilis amongst the natives of the GOLD COAST COLONY are remarkable in their number and severity. They refuse to undergo the necessary protracted treatment, with the inevitable result that large numbers of the people are seriously crippled and deformed. Amongst these ignorant people, as in the case of others elsewhere, the affection is spread largely by non-venereal means. Syphilis, at one time unknown, on the CAMEROON COAST is still comparatively seldom observed. Daniell (Sketches of the Medical Topography of the Gulf of Guinea,Lond.,1849,43,96,114,138), in an old account for the BENIN and BIAFRA COASTS, says that syphilis is perhaps the most frequent and fatal of the affections to which the male inhabitants are liable, and prevails more amongst them than amongst the women. We have it on the authority of Belley (Arch.de Méd.Nav., Jan.,1864,77) that in the GABOON country syphilis is more rarely encountered the further one travels from the coast into the interior. Syphilis is comparatively rare in the interior of the island of MADEIRA, though common enough on the coast and in the seaports. The affection is very commonly encountered on the coast of SIERRA LEONE, in the BIGHT OF BENIN, and BIAFRA, and in the neighbouring islands. In the kingdom of Benin it prevails along the river of that name (Daniell. - Loc. cit.) as one of the most common and fatal of all diseases to which the inhabitants are liable. A great number of men die from it in their youth on account of insufficient and ineffective treatment. Those who contract it in youth and survive frequently suffer from its accidents until past middle-age, the severest forms of affection being phagedenic, gangrenous, and malignant ulcers which not infrequently resist treatment on up-to-date lines. The people of BELGIAN CONGO blame the Arabs and Europeans for the importation of the disease, the aboriginal natives previously not having suffered from it. The malady seems never to have gained a firm footing in GERMAN CENTRAL AFRICA.

Syphilis is recognised as a very common disease in SOUTH AFRICA, particularly in CAPE COLONY, where the natives in large numbers bear evidence of its prevalence. In MOLTENO the disease seems on the increase; and the same is true as regards PRIESKA, DURBAN, MAFEKING, THE MOUNT FRERE, as well as the VRYBURG district. The natives of TEMBULAND, TRANSKEI, PONDOLAND, NAMAQUALAND, BECHUANALAND, and BASUTOLAND are well known for the great and increasing prevalence of syphilis amongst them, and not always by venereal means. Syphilis becomes more and more rare, as a rule, the farther one travels into the interior of the country; and we have it on the authority of the famous Livingstone (Missionary Travels, London,1857,128) that it is entirely unknown in the centre of Southern Africa, where, moreover, the natives say that it cures itself. "This dreadful disease," says our author, "never persists in any form in the interior of Africa amongst natives without a cross. It is otherwise with individuals of mixed blood. In all the mulattoes whom I have been called upon to treat, the violence of the secondary symptoms has always been proportionate to the quantity of European blood which flowed in the veins of the patient; amongst the Coronnas, the Gricquos, and the Portuguese half-breeds, the disease committed the same ravages as in Europe. I found amongst the Barotjès a disease which they call manassah, and which greatly resembles the 'foeda mulier' of history."

AMERICA. - Numerous have been the inquiries made into the prevalence of syphilis in America, in view of the fact that for long it was generally regarded as the birthplace of the disease. Dalgado (On the Appearance of Syphilis in the West Indies, Venice, 1509, No.4), however, contended that the disease was of European origin; and since his time the concensus of opinion has been in favour of his view, which is based upon the relations which have existed between the natives and colonists. It seems clear that the affection was unknown, or at least very uncommon, in the north and south of the American continent so long as the natives kept clear of the Europeans; but that afterwards the distribution of the disease was in direct proportion to the intimacy of the relations which existed between the two classes. The doctrine of the American origin of syphilis is still further negatived by the fact that even now, some of the Indian tribes are unacquainted with its manifestations, owing to their having no intercourse with Europeans. There is some uncertainty as to the amount of syphilis present in the far north of NORTH AMERICA. There is very little of it, if any in GREENLAND, despite the ubiquity of prostitution and the busy trade with Danish, American and British vessels. The same is true as regards the island of MIQUELON, - in Fortune Bay, NEWFOUNDLAND, - where syphilis was imported by the first immigrants, but took no permanent hold (Gras. - Some Things concerning Miquelon,Montp., 1867,39). In striking contrast thereto is the great diffusion of the disease in the north-west of the

continent, in SITKA, ALASKA, in the ALEUTIAN ISLANDS, in BRITISH COLUMBIA, and in VANCOUVER'S ISLAND. Among the Eskimos inhabiting the Aleutian Islands the affection is said not to be so severe now as formerly; but in Vancouver's Island, in consequence of the public carelessness in the management of the disease, it is more general and more malignant than in former years. From the beginning of the eighteenth century, and even before the advent of the Europeans, syphilis, according to Kalm (Svenska Vetensk.Acad.Handl.,xi.,280), was known in CANADA, consequent on its introduction through the frequent fights between the natives and the other tribes farther to the south who had commercial relations with foreigners. Not long before the beginning of the nineteenth century the disease became widespread and committed frightful ravages amongst the natives; it persisted from thenceforth in the form of severe epidemics at various places, and is now as prevalent as in the civilised states of Europe. Amongst the Indians of the banks of the GRAND RIVER and LAKE ERIE it was known as the "Ottawa Disease," and it was also known elsewhere as the "Disease of St. Paul's Bay." Syphilis in the UNITED STATES OF AMERICA does not differ from the same disease in Europe; amongst the negroes, however, it is frequent and severe, as it is also amongst the Indian tribes in the West, since they began to mix with the white people. According to Hunter (Amer.Med.Recorder, July,1822,412), who was carried away captive by some western Indians and did not regain his liberty for several years, syphilis was entirely unknown amongst these people until they contracted it from the whites; whole families and tribes are frequently made syphilitic on the return of wanderers from the populous white settlements on the Missouri and Mississippi, where the disease prevails in the most inveterate forms amongst the traders and boatmen who navigate the river to New Orleans. Amongst the natives of CALIFORNIA syphilis has diffused itself to such an extent that it is by no means rare to find all the members of certain families affected by it, especially since the opening of the mines; the Indians are also very commonly attacked. It was introduced by the Spaniards from Mexico; but it remained confined for long to the Indians of the South, the tribes living to the north, whom the Mexicans did not reach, continuing free from the disease. This also applies to the Indian tribes occupying the plains of COLORADO, and the banks of the Missouri and Red River, only those who have come in contact with Europeans or Mexicans showing signs of syphilis. The disease is also common in TEXAS, where it became engrafted on the populace through communications established between the Indians and Mexicans. Authorities are agreed in regarding MEXICO as a focus of syphilis from which has mainly proceeded the infection of the aboriginal peoples of the adjoining parts of the country; indeed, Mexico is the most syphilitic of all the countries in the Western Hemisphere. The affection is prevalent there

not only to unusual extent, but also has become possessed of a remarkable malignity - the people being so ignorant of the real nature of the malady that they speak of it flippantly, attribute it to general causes, and firmly believe that it is of spontaneous origin. In the eighteenth century Hunter (Remarks on the Diseases of the Military in Jamaica,Leip.,1792,214) stated that syphilis was comparatively rare in the ANTILLES, and especially in the districts where it was said to have had its origin, than in any country in Europe. Cordova (Geographical Memoirs of the Island of Porto Rico,1831) insisted upon the relative infrequency of the disease at PORTO RICO, and blames the Spaniards for its importation there. Clark(Madras Quart.Med.Jour.,1.,381) says that during the course of his observations in the WEST INDIES he found that syphilis was almost unknown in some of the islands. At the present time the affection is common in some, less so in others, and probably not absent from any. In JAMAICA the malady is very prevalent, and seems on the increase. This is true also of ST. VINCENT and some of the LEEWARD ISLANDS, though the contrary obtains in the VIRGIN ISLANDS. At HAITI the malady is very commonly observed in considerable severity, especially amongst the negroes, and the same is true of ST. DOMINIGO. In SOUTH AMERICA syphilis attains its maximum of diffusion, and in the northern parts it is one of the most familiar diseases. According to the report of the Surgeon-General for 1898-99, there are more chancres than ever observed in BRITISH GUIANA, all races suffering therewith alike. On the other hand, in DUTCH GUIANA there is less syphilis, and it is of a more benign sort, except amongst the negroes in the forests, to whom it is more common and severe. It is in BRAZIL, however, that syphilis seems to have its main focus, and so common is it that the people there jest about it and refer some of its manifestations to an attack of rheumatism or gout. It ranks next to Mexico as regards distribution and intensity, this fact being correctly attributed to the low standard of morals, the practice of abominable vices, and the general ignorance and carelessness of the people. The affection is there seen in some of its worst forms and the mortality is very high. The other South American States are only a trifle less affected by syphilis, which is seen to a terrible extent in the ARGENTINE STATES, whose peoples are daily seen in large numbers with the most frightful disfigurements of the face; scores of them are to be seen in the streets of CORDOVA begging, and about a third of the entire population of that place are said to be syphilitic. The affection is also very prevalent in CHILI, BOLIVIA, and PERU. According to Fournier (Arch.de Méd.Nav., Sept.,1874,147), of 912 deaths in the hospital of La Caridad at VALPARAISO from May, 1871, to March, 1872, 52 were from syphilis, which statement is bereft of a semblance of exaggeration when we take into consideration that Savatier (Ibid.,Jan.14,1880) reports that out of 972 patients admitted into the hospital during the course of twelve months (1877-78), no less than 485

were syphilitic. In Peru, where the affection is equally common, it was, according to Tschudi (Oest.med.Woch., 1864,474) quite unknown prior to the advent of the Spaniards; and even at the present time the affection is very rare amongst the natives in the pampas of SACRAMENTO in the basin of the Ucayli. Finally, it may be noted that syphilis is quite common in BOLIVIA, PARAGUAY and the states of RIO DE LA PLATA, where and elsewhere in the Argentine States much deformity and crippling from the disease occurs.

CLIMATE.

In view of the fact that syphilis is almost equally diffused in all latitudes, and that many parts of the cold zone in both hemispheres are as syphilitic as temperate or sub-tropical or tropical regions, it seems improbable that it is influenced at all by climatic conditions. Those who point to the greater prevalence of the affection in many countries of the temperate zone, - in Europe especially, - may have their objection answered by the qualifying circumstances of hygienic contingencies. Even the severity of the disease does not seem dependent upon climate; and there is much evidence in favour of the fact that syphilis is of a milder type in warm or tropical climates, in certain countries of which it is less severe and more amenable to treatment than elsewhere. In this connection Italy, Greece, Turkey, the coast of Syria, - in contrast to the highland districts, - the Abyssinian littoral, the interior of Egypt, Tunis, the West Indies, the shores of Mexico, and Peru have been cited; against which it has been urged that the statistical compilations are inaccurate or unreliable, that it is by no means proved that this comparatively mild course of the affection is due to climatic circumstances, and that the most severe cases of syphilis are actually seen in lower latitudes, in which both natives and foreigners present specific phenomena of the worst possible kind. Italian physicians now state that the disease is much more severe in the southern provinces, and in Sicily, than the northern; and Portuguese practitioners tell us that syphilis in their country is not any milder than in our own. Griesinger and others affirm that in Tunis syphilis shows a comparatively mild course; but such observations are based on error or insufficient observations, and in the face of the assertions of others that syphilis is one of the most dangerous and deforming affections of that country. Competent observers tell us also that it is extremely malignant in India and the Malay Archipelago, in all parts of which it is widely diffused, thetropical climate apparently not being very favourable to the treatment of the constitutional disease. This is also true as regards Cochin China and China. In Algiers all are agreed as to the malignity of the syphilitic cases observed; and in Upper Senegambia the sequelae are of a very serious sort. There are similar reports from the

Guinea Coast, Brazil, and other parts. Furthermore, except in the Chinese ports where the foreigners suffer most from the severe manifestations of the disease, syphilis in all the tropical and subtropical parts of the world is just as malignant and obstinate to treatment in natives as others; and in some such localities as Algiers it is even more malignant in the former.

ALTITUDE.

The distribution of syphilis appears to be in no way influenced by the height above the sea-level, though some of the older writers, - e.g., Jullien (Arch. de Méd. Nav., Oct., 1867,246) and Rey (Ann. de Dermat.,1880,C.ii.,686), - maintain the contrary, instancing their contention with the comparative mildness of the affection on the table-lands of Mexico, Abyssinia and Armenia.

RACE.

It is possible that racial conditions may have some effect upon the distribution of syphilis in certain communities; and in view of well-ascertained facts the inhabitants of such countries as Iceland, Greenland, and Madagascar have been considered as relatively insusceptible to the disease notwithstanding their free intercourse with other parts of the world. As regards Iceland, the affection was imported there in 1756 and 1824 and attacked about a score of the natives. During the nine years which Finsen practised there he saw only five cases of syphilis, all of them being in strangers to the country. "When we consider," writes our author, "that Iceland is visited every year by hundreds of ships, partly Danish trading vessels, partly French and English whalers, which give rise to communication with the inhabitants in the most various ways, it must seem a piece of good fortune that the natives have not been infected more often." Gras affirms for Miquelon, in Newfoundland, that syphilis was imported by its first settlers, but failed to take hold upon the natives. "I have not," he says, "found a single trace of its having been actually developed; and, although I have found evidence of secondary and tertiary lesions among the older generations, I have never seen anything in infants which would justify me in believing that the malady has been transmitted by heredity." Writing of Greenland, Lange dwells upon the fact that it is "remarkable that there is absolutely no syphilis here; about the fact itself there is not the slightest doubt, and the strangeness of it will perhaps seem less when we remember that the same is true of Iceland. The circumstance is explicable simply and solely on the ground that Greenlanders, like Icelanders, have an immunity from syphilis; for there is no lack of opportunity for infection. Greenland is visited every year by vessels from Denmark, at whose departure from the mother country there are certain precautions taken to prevent the importation of

contagious diseases; but hardly a year passes, especially in the northern parts of the country, without several settlements having to provide quarters, for a longer or shorter period, to considerable numbers of men shipwrecked from British and American whalers; and besides there are other occasional visitors. Now, considering that prostitution is carried on, both on board ship and on shore, with an absence of all restraint which baffles all belief, it certainly cannot be said that the Greenlanders have not had ample opportunities, during nearly a century and a half, of becoming infected with syphilis. Livingstone (loc. cit.) has testified to the immunity from syphilis which is enjoyed by the negroes of the southern regions of Central Africa, where very seldom cases are observed, as also in Bechuanhaland and then mainly through importation from Cape Colony; still his observations have not escaped criticism by more recent writers. The frequency and infrequency of syphilis in other places has also been referred to. It is reasonable to conclude that the relative immunity from syphilis enjoyed in certain parts is not due to any peculiarity of race. In the case of Iceland the natives come of Scandanavian stock which gives innumerable instances of the affection in Sweden, Norway and Denmark; and the Greenlanders differ in no respect from other Eskimo tribes on the western side of North America, who have had syphilis in its severest forms. Again, in contrast to the negroes above referred to, those on the East and West Coasts of the African continent sometimes have syphilis more severely than persons of other nationalities. Explicable on the theory of faulty hygienic circumstances is the fact that syphilis finds its widest diffusion and its worst types, other things being equal, in those countries or amongst those peoples who are attacked by the disease for the first time in their national existence. In spite of the offended sensibility of the ultra-purists, there is no denying the fact that syphilis has been more diffused and more severe the greater has been the neglect of public and private hygiene and the indifference to the practice of indiscriminate and uncontrolled prostitution. This has had a distinct bearing upon the racial susceptibility to the disease; and it has become aphoristic in expression that, caeteris paribus, syphilis is in frequency directly proportional to the public indifference to the supervision of prostitution. As regards the influence of race upon the form or severity of the disease, innumerable observations show that in the countries in which the races intermingle, and especially in the tropical regions of Asia and America, there is not any noticeable difference in this respect, though it is perhaps true that destruction of the pharynx is more frequent amongst the coloured races, the Turks especially. It would appear that in the countries of the East, and particularly in Egypt and Arabia, the tendency to erythematous, vesicular, and squamous syphilides is in proportion to the fineness and whiteness of the skin. On the other hand races with thick

skins, such as the Egyptians and the Abyssinians, are somewhat prone to serpiginous and warty eruptions and nodes. The blacker the skin in the individual, the darker in colour will be the spots and cicatrices observed - a fact which distinguishes syphilidis from stimulating eruptions. It has been said that syphilis may become aggravated by transmission from one race to another. "If," says Gauthier (Two Years' Medical Practice in Canton, Thèse de Paris, 1863),"we renew the poison by drawing it at distant sources from subjects of a different race, inhabiting a different climate, and submitted to a different hygiene, we shall immediately see the disease assume a surprising intensity, and lesions the most insignificant become very serious." This assertion is based upon the fact that in the Chinese seaports, and perhaps also in some others, the disease is more common and more severe in the naval and military men who call there. But, apart from the question of race, there are such qualifying factors as passage from one locality to another of a different temperature, the want of acclimatisation, frequent intemperance, and so forth, which must be taken into consideration.

AGE.

No matter how young or how old an individual may be, he or she will contract syphilis. It would seem, however, that there are certain ages at which syphilis is more commonly observed. Thus, hereditary syphilis makes its dèbut after the infant is a day or two old; and owing to the greater frequency of exposure to the specific cause, youth is the time of life when most cases of syphilis are seen. The age of puberty and of the menopause, - especially the former, - in the opinion of some is regarded as operative, puberty being the time when cases of tardy hereditary syphilis are apt to break out, and the menopause when the results of unsatisfactory treatment are specially in evidence.

SEX.

This is also an unimportant predisposing factor in itself, both sexes being equally liable to syphilis; and if fewer women appear in statistical compilations than men, it is due to their being less debauched and exposed to infection. It has been said that pregnancy nearly always is characterised by the appearance of secondary troubles in women recently infected, the disease seeming to awaken under its influence. Delivery is apt to make the affection more severe than it otherwise would be. According to Cullerier (Jour.Gèn. de Mèd., de Chir., et de Pharm.,T.lx., 1817,p.343), the symptoms of the disease are usually less severe during the period of gestation, the infection which may take place at the same time as conception sometimes remaining concealed during the whole of the pregnancy, and not showing itself openly until after delivery. Various other authors assert that syphilis, which has been latent for a longer or shorter time,

suddenly declares itself in the form of an eruption when pregnancy occurs, at delivery, during the menstrual period, or at the menopause. Such authors would have it that menstruation, and still more the cessation thereof, acts in the same way as pregnancy and delivery and favours the appearance of secondary phenomena.. The author first quoted dwells upon his observation that syphilis often shows itself at the menopause after having lain dormant for many years, sometimes even for the first time, being then not infrequently very obstinate and accompanied by severe manifestations.

ALCOHOLISM.

The abuse of alcohol has been frequently cited as a predisposing cause of syphilis, and many of the older writers devote to its consideration considerable space. According to Ricord (loc. cit.), intemperance in alcoholic beverages, especially in warm seasons, leads to the simplest chancres becoming inflammatory; and he also observes that in certain regions (Lettres on Syphilis,Ed.3,Paris,1863,p.255), especially in the genital organs, the cellular tissue becomes oedematous and later gangrenous. Bassereau (loc. cit.) also mentions the malevolent influence of alcoholism, which he blames for the early appearance of syphilides in the numerous cases under his care.

INSANITARY CONDITIONS.

Overcrowding, uncleanliness, poverty, and misery are all factors in the occurrence of syphilis, as the historical facts already enumerated clearly prove. Density of population is a prolific cause of immorality; and on grounds like these it is easy to explain the appearance of the great epidemics of syphilis during times of war, in which the most unfavourable conditions abundantly obtain. Insufficient or bad food is believed to be a powerful agent in the aggravation of syphilitic accidents. Idleness, which is common accompaniment of uncleanliness, must also be taken into consideration; and damp, exposure to cold, and other circumstances in this category have all a certain etiological interpretation.

TRAUMATISM.

To this has been ascribed the anatomical determination of syphilitic lesions. Thus, Duverney (Diseases of the Bones, Paris,1751,T.iii.,pp.477-479) says that the greater frequency of exostoses upon the bones of superficial location is due to the fact that such bones are more than any others exposed to atmospheric influences, contusions, and various other forms of traumatism; and Virchow mentions this as a determining cause in various hepatic affections of syphilitic origin. Numerous other writers are of the same opinion.

CONSTITUTION.

In spite of what some of the older writers affirm to the contrary, there is no constitution and no TEMPERAMENT which can be said to predispose to the generalisation of syphilis.

INTERCURRENT DISEASES.

Not a few of the writers of former times blame these for the development of syphilitic phenomena. Hunter, for instance, considers the least derangement of the system enough to give rise to them; and speaking of a patient who had secondary symptoms for the first time in the month of August, 1781, and a repetition thereof in the following June, under the coincident occurrence of influenza, he vaunts the opinion that the interval would have been longer if the fever had not determined the second outbreak. Not a few of the authorities of the past have agreed in recognising the influence of acute diseases upon the development of syphilitic symptoms and complications; and there are not wanting writers of our own time who have come to the same conclusion. Bassereau (loc. cit.), however, did not entirely subscribe to this idea; he says that the cases he studied convinced him that intercurrent affections which may have weakened the system at a period little removed from that of the contagion cannot be considered as determining causes of the generalisation of syphilitic lesions in the organism. Others, however, find it difficult to deny to the eruptive fevers, especially to smallpox and vaccinia, the power of calling forth certain manifestations of the disease. Bamberger (Gaz.Hed. de Mèd. et de Chir.,1858,p.390) reports two cases in which the influence of an attack of variolaupon the appearance of syphilitic symptoms seemed to him little doubtful; and Friedenger and Viennois (On the Transmission of syphilis by Vaccination,Arch. de Mèd., June,1860,p.647) describe similar experiences in regard to cowpox, the latter writer devoting considerable space to their great diagnostic utility in cases of vaccinal syphilis. Scrofula and tuberculosis have been likewise cited in this connection.

MENTAL INFLUENCES.

Syphilis, hitherto latent, may have its awakening determined, so we are told, by moral derangements and mental influences, elderly people marrying for the first time being examples also quotable. Idleness, predisposing to immorality and debauchery, is also not without influence indirectly; and in countries in which conscription obtains the reawakening of syphilis by virtue thereof had also been observed.

HEREDITY.

The influence of heredity in the production of syphilis was pointed out for the first time by Paracelsus in 1536. Fourteen years later, Brassavole

described a case of hereditary syphilis in an infant which infected its nurse. In 1554, Amatus Lusitanus published one of the first observations of the hereditary disease. The vast majority of syphilographers have since then admitted the hereditariness of the disease; though Hunter denied it, he nevertheless reported two typical cases of congenital syphilis. Some of Hunter's pupils, however, dissented from him and published erudite disquisitions in favour of the transmission of syphilis from parent to child. The learned Ricord was one of these, and others of note were Diday, Doublet, Mahon and Bertin. In spite of all former-time opposition, this mode of transmission is now most firmly established, the affection handed on in this way not being so as a tendency or predisposition, but as an active and contagious disease. Abraham Colles (The Works of Abraham Colles, Edited by Robert McDonnell, New Syd.Soc.,Lond.,1881) deserves every credit for having done much to bring this agency into prominence. After an occupation of the chair of Surgery in the Royal College of Surgeons of Ireland extending over thirty years, he resigned and prefaced his well-known work on "Syphilis in Infants" with the statement that - "Perhaps there is not in the entire range of surgical diseases any one the contemplation of which is more calculated to arrest our attention or to excite our interest than syphilis infantum." Hereditary syphilis, like its parent disease, although it was not then, and is not at the present day, strictly relegated to the dominion of surgery, was generally treated of by the surgeon. And yet, in the great majority of instances the management of such cases, especially as regards their family relations, the relations of husband and wife, the management of the latter during pregnancy, the delivery and the subsequent care of the child, the necessary attention to the safety of other members of the family (in fact, all of the most weighty responsibility) falls upon the ordinary medical attendant. In view of this, I purpose devoting to its consideration the proper amount of space. That syphilis may be conveyed from parent to child has been generally believed since the vaunting of the hypothesis at the end of the fifteenth century; and we have seen that the facts in favour of it are so numerous and convincing that, despite a few distinguished opponents, - amongst whom Hunter (Works of John Hunter,Vol.ii.,p.383) was the most conspicuous, - and it has been unhesitatingly accepted by the profession down to the present day. As regards the method of transmission, however, controversy has been rife. Opposing theories have been constructed and ardently supported, differing radically as to essential points, often resting on exceptional or anomalous, and still oftener upon instances imperfectly observed; thus the belief of Gaspard Torella , in 1498, and Matthoili, in 1536, that it came from the nurses through the milk, was generally accepted: and Parrot (Progr.Méd., Nov.3, 1877,p.798), in a clinical lecture said that the infection of children was known, but its true origin was not suspected.

Bearing upon this subject is the important question of the marriage of syphilitics; for it concerns the welfare of many persons and modifies or fixes the conditions or circumstances of one or more lives. The responsibility of advising or consenting to the marriage of a person who has once had syphilis is undoubtedly great; the responsibility of prohibiting it is, however, no less so. Matrimony is the natural condition of the majority of individuals. Enforced celibacy, especially in males, brings with it not infrequently a long train of attendant evils, moral and physical. It will not do to assume that professional duty is properly discharged by telling all the patients to be on the safe side and to remain single lest the wife or offspring become syphilitic, unless it can be clearly proven that a lifelong and definite and unavoidable risk obtains in every case; the medical man who, on account of past syphilis, forbids marriage to an otherwise eligible man must bear in mind that he forbids it at the same time to some woman, who, possibly, if well informed as to her risks, would willingly encounter them: and respecting a malady so common as syphilis, while it is our duty to warn, it is also not infrequently our duty to encourage. The method of answering the question under consideration are twofold, viz., first, by considering the probabilities in regard to the essential nature of syphilis, and, second, by carefully weighing the clinical evidence in the matter. It seems evident that belief in any particular theory of syphilis, assigning it to this or that class of disease, must have an important influence in determining the opinion which is held as to its curability, or at least as to its being capable of transmission for an indefinite period. Now, if the late symptoms, the so-called tertiary manifestations of the affection, are held to be evidences of the presence in the system of the specific virus, which has simply remained for a long period, perhaps for many years, latent or quiescent, and which is thus again manifesting its power; if syphilis is believed, accordingly, to be a practically unlimited disease, conforming to no known law as regards its duration, corresponding to no other infectious or contagious malady in having a period of termination, - more or less delayed perhaps, or more or less indefinite, but still invariably present, - at which either the particular poison or the susceptibility of the system to its influence has become exhausted; - if tertiary syphilis, in other words, is regarded simply a continuance or recurrence of the disease, differing in no essential respect, except as to the particular tissues involved, from the disease in its early stages, it is difficult to persuade oneself as to the justifiability of ever recommending marriage to a person who has once contracted syphilis. In certain respects syphilis is a most mysterious disease, and in no given instance is it safe to assure a patient of further complete immunity from the disease. In any case, however mild its course or under whatever treatment, there is always an element of doubt as to the

development of subsequent symptoms. The probability of their appearance may be reduced to a minimum, the character of the case and the thoroughness of the treatment may both seem to give assurance that a cure has been completed, and yet both the patient and his medical attendant may be mortified and annoyed by an outbreak of tertiary manifestations. This possibility is admitted by every one of large experience in the study of the disease, and furnishes, moreover, the chief argument to those who deny or are sceptical as to its curability. It would therefore be obviously imprudent to allow marriage, with its attendant risk of inoculating the wife and the consequent double risk of producing a syphilitic infant, if it were impossible to predict with any sort of certainty that the contagious and highly transmissable stage of syphilitis would terminate during the life of the individual. On the other hand, if, as was formerly taught by Hutchinson (Reynold's System of Med.) syphilis is one of the exanthemata, having, like them, a period of subsidence, and followed, like them, by certain non-contagious sequelae, which we call the tertiary symptoms, but which are merely relapses or degenerations of parts affected during the secondary stage, it becomes evident that the risk of transmission to wife or husband or children after the lapse of a certain interval becomes greatly reduced or almost nil. Thus, no one thinks of prohibiting marriage because an antecedent attack of variola or scarlatina or enterica, despite the rather serious sequels of these affections not infrequently observed. Again, one's ideas will be materially modified if another and still more plausible theory of syphilis is adopted, and we look on the tertiary period as one of contraction or obliteration of lymphatics due to long-continued irritation by new cell-growths of the secondary stage. During the primary period, then, when the new cells, which are the carriers of the syphilitic microorganism, are accumulating at the site of the original inoculation, constituting the induration of the chancre, or are slowly finding their way into the general system through the lymphatics, proliferating in their walls and thickening and hardening them, or during the secondary period, when they are rapidly multiplying in all the tissues of the body, the risk of inoculation or transmission would obviously be great. When, however, by destructive metamorphosis and degeneration, either with or without the aid of drugs, they have been eliminated from the body, the contagious element disappears with them; and although here and there throughout the body some important lymphatic trunk may have undergone irreparable injury, and may have been contracted or obliterated, permitting of the accumulation of waste products until the node or gumma or tubercle which we call a tertiary symptom makes its appearance, yet the affection has lost much of its terror, and has become dangerous only to the patient himself. I have entered into the consideration of these theories only by way of the elucidation of the statement that belief in one or other of them has an important bearing on the relation

of syphilis to marriage, and because, whichever is thought to be the most plausible, they equally lessen or altogether do away with a certain proportion of the danger formerly thought to surround the marriage of a syphilitic even after a most protracted interval. It is not necessary to accept either the one or the other implicitly. The essential point is the recognition of the fact that modern syphilographers, as a rule, regard the tertiary or late symptoms as indicative of damage done during the active period, - in other words, as relapses or sequels, and not as fresh outbreaks of a highly contagious and transmissible disease. This view is favoured by their time of appearance, their entire want of symmetry, the non-contagiousness, their non-inoculability, and other facts. In endeavouring to find corroborative evidence in clinical facts, we must first of all confess that there seems little doubt amongst those of large experience in the observation of the disease that in rare instances syphilitic children have been born to parents who had long passed the limits of the secondary period. At least the great majority of clinicians dwell confidently on the exceptional occurrence of such cases, and assert that syphilis may be transmitted during any of its stage. (Vide Belnomme and Martin. - Treatise on Syphiliitis,p.413). If, however, we come to look for positive evidence in this respect, we will find very little that is entirely satisfactory. Cases have been described, it is true, in which eight, ten, twelve, or even fifteen or twenty years after the primary lesion, syphilitic persons have become the parents of children manifesting obvious specific symptoms. Search into the history of the cases usually reveals the omission of many important facts without which it is impossible to be certain of its true character. One may ask if both parents were originally infected; and in the contrary event has a case of syphilis occurred in the one who at first escaped. Also, if they were both diseased originally, has either become subsequently re-infected, which is a much more frequent accident than has been commonly supposed. In applying these tests to the cases in question it will be found that few, if any, of them are thoroughly convincing. Kassowitz's observations (Die Vererbung der Syphilis,Wien,1876), made, it should be borne in mind, upon persons with whom no mercurial treatment has been employed, seemed to show that the average limit of transmissibility was about ten years, after which time healthy children began to be born. His observations, however, were incomplete in many respects, and, like all such investigations, are of course upen to the suspicion of intentional deception on the part of the patients. Even these cases, however, show unequivocally, as do all which have ever been published, the steady diminution of the transmissive power under the influence of time alone. There are a few notable exceptions to the list of authorities who seem to have no doubt as to the long continuance of this transmissive power in rare cases. Fournier (Syphilis and Marriage), one of the most eminent

syphilographers of modern times, says that in cases of paternal heredity the duration of the force of transmission never exceeds at the maximum three or four years. In no case of the many hundreds he has observed has he known a syphilitic father to infect a child, - the mother being healthy, - at a later period than the one mentioned. Furthermore, he is equally positive that the gradual diminution and final extinction of the syphilitic reaction of the parents upon the children is a veritable pathological law, demonstrated beyond the possibility of a doubt. A remarkable case, in which in the history of a couple, both syphilitic and untreated, eight pregnancies occurred, is described by Mireur (Essay on the Heredity of Syphilis, Thèse de Paris, 1867, p.91). The first resulted in abortion at the fifth month; the second, on abortion at the seventh month; the third in a stillborn; the fourth, a syphilitic child dying in one month; the fifth, in a syphilitic child dying in forty-five days; the sixth, seventh and eighth, in living, healthy children. The most interesting point perhaps in this observation is the fact that during a portion of the time, and immediately after the last three pregnancies, which resulted in the birth of healthy children, both husband and wife manifested grave tertiary syphilitic symptoms, such as gummata, tubercles, ulcers, and so forth. This is urged as a direct evidence of the strongest kind in favour of the view that syphilis ceases to be transmissible by heredity at the end of a certain period, as we know that it ceases to be contagious or inoculable. In his "Practical Treatise on Venereal Diseases" (Paris, 1838, p.644), Ricord, and even Astruc and Doublet (Legendre. - New Researches on Syphilis, 1841) before him, vaunted the same hypothesis, the first-mentioned observer asserting that in the tertiary stages the only effect of the disease upon the children was so to modify their organisation and temperament as to expose them to developments of a scrofulous character - a view which subsequently Gras has strongly urged. Though omitting to give reasons for his belief, Bazin (Lectures on Syphilis, 1859, p.35) also denies absolutely that tertiary syphilis is any more transmissible than it is communicable in other ways. Hill and Cooper (Syphilis and Local Contagious Disorders, Lond., 1881, p.62) that the transmissive power continues as long as the secondary eruptions are present, but usually ceases when the tertiary stage is reached. Buren and Keyes (Genito-urinary Diseases and Syphilis, 1874, p.521) are of the opinion that fathers with tertiary syphilis certainly, as a rule, procreate non-syphilitic children; and, in speaking of the fact that when the mother has syphilis the child is generally infected, they except the later tertiary stages. Bumstead and Taylor (Venereal Diseases, 1879, p.739) tell us that without mercurial treatment the danger of transmitting the disease to offspring usually persists up to the fourth year of syphilitic contagion; Lane (Lectures on Syphilis, Lond., 1881, p.65) that it is the rule that when the parents have fully reached the tertiary stage the children born to them show no signs

whatever of syphilis; and Hutchinson (Med.Press & Circ., Aug.2,1882,p.85) that it is almost an acknowledged law that parents in the late tertiary stages do not give the disease to their children.

Similar opinions have been vaunted by Diday (Treatise on Syphilis in the Newborn, Paris,1854,p.183), Bertin, (Treatise on Venereal Diseases in the Newborn,Paris, 1870,p.142), Brazin (Op.cit.,p.164), Roger (L'Union Méd., 1865,T.i.,p.147), and others, all of whom show a strong tendency to limit more or less strictly the period of transmissibility of syphilis, even when the disease is allowed to progress without treatment. As to the facts that it becomes milder in time, both in parents and offspring, that it ceases to be conveyed from husband to wife or vice versa, that with each succeeding year after the termination of the secondary period the chances of escape of the production of conception increase in a rapidly augmenting ratio, - there is no difference of opinion whatever. Neither is it seriously disputed that the length of time during which the disease remains active, as well as the degree of its activity, may be markedly and beneficially influenced by the administration of mercury. Under proper medication patients who have rashly or disobediently married in the height of the secondary period have been enabled to escape the danger of transmission either to spouse or offspring: have, in fact, had children born healthy and who never subsequently developed any syphilitic symptoms.

A description of the methods by which syphilis can attack the child from one or other of its parents may be appositely prefaced by a consideration of the ways in which they can infect each other. The father can derive syphilis from the mother only in the usual way, that is, by contagion through a breach of surface permitting the direct absorption of the virus of syphilis, the disease in its development being attended by the usual phenomena of chancre, lymphatic enlargement, syphilodermata, and so on. The mother may, - and in the vast majority of cases does, - acquire the disease from the father in the same way. But there seems good reason for believeing that she may also become infected through the medium of the child, who receives its syphilis directly from the father, the mother up to the time of conception having escaped contagion. Furthermore, it appears to be highly probable that no woman ever bears a syphilitic child and remains herself absolutely free from the disease. The strongest argument against the theory that every woman who has had a syphilitic child has herself been infected lies in the existence of cases like the following, several of which have been observed. The wife of a man having active, but untreated, syphilis gives birth to one or two syphilitic children, she herself developing no symptoms. Later, the husband is placed on mercurial treatment. She then conceives and gives birth to a healthy child. He stops treatment, and she again bears a syphilitic child, which on his resuming his mercurial treatment is followed by another healthy infant. Such cases certainly indicate that the syphilis of the mother, if any exists, is incapable of transmission to the child, as the

effect of the treatment of the father is too direct and unvarying to admit of doubt. The existence of this form of infection, - syphilis by conception, - has been vehemently denied by numerous authors, - Kessowitz, Von Baerensprung, Bidenkap, and others, - by some on the theoretical grounds that as the essential elements or carriers of the syphilitic virus have been shown to be cells or protoplasmic particles, and as, after conception, the embryo is supplied with serum, but not with cells of any kind, it is impossible that syphilis can be conveyed either to or from it (Bumstead and Taylor. - Op. cit.,p.742); by others on the reported observations of numerous cases in which mothers who have been delivered of syphilitic children have shown no signs of the disease. Nevertheless, it wouls seem that, setting aside arguments based on theoretical considerations, the weight of clinical evidence is altogether in favour of the frequent, if not the invariable contamination of the mother through the medium of the foetus. Everyone of large experience in this class of cases must have seen some in which the husband, having had syphilis and having married after an insufficient interval or an imperfect course of treatment, has infected his wife with the disease, although at the time no discoverable symptom is to be found on his body, - no abrasion, sore, mucous patch, no lesion of continuity or suspicious point of any description. An equally careful inspection of the woman will also in such cases be attended by negative results, - no initial lesion, no spot of induration, no enlargement of the lymphatic glands being discoverable, - and yet she will be found with unmistakeable evidences of constitutional syphilis. Colles himself described a typical case in his works, and since his time hundreds of others have been reported. In all such cases, provided that no mistake has been made and that both husband and wife are really free, - the one from any contagious lesion, the other from any evidence of a previous or present primary sore, - it will be found that pregnancy has occurred; that the woman has either been delivered of a syphilitic child or has had an abortion or miscarriage at some time before the outbreak of the syphilitic symptoms. Although this statement of facts is based upon careful clinical observation, and although this view has been received the unqualified endorsement of no less an authority than Fournier (Op. cit.,pp.26-30), - who confesses to complete ignorance as to the precise method by which this contagion takes place, whether by poisoning of the fecundated ovule at the momemt of conception (the theory of Von Baerensprung) or by exchange of the uteroplacental circulation, and regards the various hypotheses upon these points as without practical value, - it is yet strongly combated by many excellent authorities. They say in reply to the above arguments that the reported cases are open to just criticism, that trifling and unnoticed lesions of the father, - chafes or abrasions almost microscopical, - suffice to transmit it on his part; while as an explanation of the supposed absence of primary lesion in the mother they plead the well-known difficulty of

discovering it in women under any circumstances. An argument of an unanswerable sort lies in the application to the case in question of the well-known law of Colles, which from the date of its first enunciation by the distinguished expounder to the present day has been found to be absolutely without exception; no other statement in reference to the disease is at once so sweeping and comprehensive in its bearings and so completely substantiated by clinical experience. "One fact," he says, "well deserving our attention is this: that a child born of a mother who is without obvious venereal symptoms, and which, without being exposed to any infection subsequent to its birth, shows this disease when a few weeks old, - this child will infect the most healthy nurse, whether she suckle it or merely handle or dress it; and yet this child is never known to infect its own mother, even though she suckle it while it has venereal ulcers of the lips and tongue." (Colles. - Op. cit., Chap.xiii.,p.287). The truth of this law is generally admitted by practitioners of experience everywhere. It has received the assent of every authority who has written upon the subject since it was propounded. It has attracted attention at home and abroad, and it is doubtful if a single genuine exception to it has ever been recorded; the cases of Cazenave (1847), Cocchi (1858), Ranke (1878), Guibout (1879), Scarenzio (1880), and Zingalbs (1882) are defective in important particulars, the first two so as to render them useless; that of Ranke is by far the strongest yet recorded, but lacks fulness and rests upon his unsupported testimony. (Vide Hill and Cooper.- Op. Cit.,p.55; and The New Dictionary of Medicine and Surgery,Paris, Vol.xxxiv.,p.687). Colles' law has now come to a position of classical importance. Everyone must have seen chancres on the nipples of wet-nurses. They are, indeed, not very infrequent. But no one has seen such on those of the mothers of the infected children. Bearing in mind that it is very unusual to put a syphilitic infant out to a wet-nurse, - no prudent practitioner would allow of this, - and that probably for one so nursed a hundred are suckled by their mothers, and we shall appreciate the weight which this entire absence of proof that mothers ever suffer bears. In the opinion of most it amounts to proof that they are absolutely insusceptible. Writing in the "Archives of Dermatology" (April, 1878,p.103), Hyde says that the full weight of Colles' law is to be estimated in connection with the question whether the child whose hereditary syphilis is derived from the mother exclusively is capable of infecting its healthy father; and if no instance of this latter can be adduced, a higher law becomes defined, namely, that the child whose hereditary syphilis is transmitted by one parent only is incapable of infecting either. He explains this hypothetical immunity, in which he seems to believe, by saying that it is probably due to the fact that the syphilis-bearing cell-element cannot readily be implanted upon the soil from which it sprang - a fact illustrated by the infecundity of consanguineous marriages and the non-autoinoculability

in general of the primary lesion of syphilis. When, however, we exclude the large number of cases in which the father is already syphilitic, and remember that in the others the contact between him and the child is slight, infrequent, and fleeting, - being usually limited to an occasional caress or kiss, - it does not seem strange that no instances of such infection have been reported; nor does the fact seem at all worthy of being made the foundation of a general law. The fact that the mothers who have thus acquired an immunity have done so by first acquiring the disease, is the only rational explanation of these facts. It may, in those cases where no secondary symptoms appear, be in a modified form, due, as suggested by Hutchinson (op. cit.) to some heteromorphism or alternation of generations on the part of a specific fungus, or to the exclusively small quantity of the poison which finds its way from the child to the mother, or to some other obscure cause with which we need not at present concern ourselves. It is, at any rate, no more mysterious than the protective influence of vaccine in smallpox, and when one is rationally explained doubtless the other will be found to be closely allied in its mode of action. The fact which interests us at this juncture is that it is in the highest degree improbable that anything but some form of syphilis itself could afford this entire protection, and that it is not in the least unreasonable, but, on the contrary, logical and consistent with all the known facts, to suppose that while in some cases no observable symptoms might be produced, on others where the cause was the same, but more active, or the power of resistance less, the usual constitutional symptoms would make their appearance. It seems clear, then, that the father may infect the mother either in the usual manner by direct contagion, through the medium of the child, or at any rate by the production of conception. The hypothesis vaunted by Baerensprung (On Hereditary Syphilis), that syphilis of the mother is imparted to her at the moment of impregnation, the disease being impressed upon the fecundated ovule, does not materially conflict with the above views, conception being in either case the essential factor, but in the latter instance the intervention of the foetus itself not being necessary. It has to support it the clinical fact that in those cases where syphilis appears during pregnancy the outbreak of symptoms occurs at about the ninth or tenth week after the date of conception, or at a period which closely corresponds to that of the appearance of general symptoms after exposure to ordinary contagion, allowing three weeks or so for the so-called incubation of the primary lesion and two times that period for the secondary incubation. This has been shown not only by the author mentioned but by Diday (loc. cit.), whose observations were intended to prove the possibility of syphilis being derived from the child by the mother; in over a score of cases the period at which the first eruption appeared in the mother averaged sixty-five days after conception, and only once did the first signs of the affection develop after the fourth month

of utero-gestation. The above may also be said to be rendered probable by the following line of argument: Colles' law, which is without genuine exception, demonstrated that every woman who has had a syphilitic child has been herself infected, even if she has had no observable symptoms of the disease (it is obviously no explanation of the law of Colles to say that it would seem to indicate that the escape of the mother is due to some occulent, undiscernible change in her system, as Bumstead and Taylor affirm); cases are recorded, however, in which a woman having given birth to one or more syphilitic children, and therefore herself syphilitic, bears healthy ones in consequence of specific treatment given to the father before and during the period of conception, she remaining untreated; the determining cause, therefore, of the syphilis of the child is not the syphilis of the mother, but the condition of the fecundated germ of the father; and, as a corollary, the determining cause of the syphilis of mothers in whom the disease follows conception is not by infection from the foetus through the uteroplacental circulation, - on account of the absence of celular elements in the fluid interchanged, - or otherwise, but is the diseased male procreative cell which blended with the female ovule. (Parenthetically it may here be noted that an erudite disquisition, based upon 21 cases of childbirth, was written by Fraenkel (Arch.f.Gyn.,1873, Vol.v.,p.1) to prove by the condition of the placenta that direct infection of the child by the father was possible without the participation of the mother, and that when the latter became infected it was through the medium of the child. In 14 of his cases the specific change in the placenta began in the foetal portion or affected it exclusively. These cases, however, as analysed by Hill and Cooper, - Op. cit.,p.57, - are altogether defective in important particulars. Of course, to sustain his theory there should be indubitable evidence that the fathers were syphilitic, and that the mothers were not so. So far from this being the case, but one of the fathers was known to be syphilitic, while two of the mothers had evidence of constitutional syphilis at the date of childbirth, and nine others had markedly suspicious histories. The lesions of the placenta which are thought to be syphilitic consist in the development of papular or gummatous growths which give rise secondarily to inflammatory troubles, affect either the placenta itself or the placenta and the uterine mucous membrane.) If the premises be admitted, the conclusions seem irresistibly to follow. There is no proof whatever that the demen of s syphilitic male is contagious or can transmit the disease in any but the way above mentioned. On the contrary, it has been shown experimentally, by Mireur (Ann. de Derm. et de Syph., 1876,p.77) and others, that it is entirely harmless and incapable of giving syphilis to others. Various other theories have been advanced, but as they are so entirely hypothetical and unsupported by trustworthy evidence, we can pass them over without description or comment.

Having considered at some length various theoretical matters bearing on the subject, we may now turn to an investigation of the methods by which the child becomes syphilitic, the same concerning descent from the father, descent from the mother, and direct infection. It is obvious that the influence of the father upon the child, so far as heredity, ceases at the moment of conception; or, to be more explicit, to subsequent condition of the male parent, no development or acquirement of disease, can exert any further effect. It is quite certain that the existence of active syphilis in the father may result in the transmission of the affection to the offspring. There are, it is true, not a few instances in which both mother and child have escaped though the father showed at the time of conception very active secondary lesions. These, however, are exceptions, and do not in the least invalidate the rule that it is possible for a father to hand the disease directly to his child. There is no other possible interpretation of the cases already alluded to in which successive pregnancies in the same woman alternately resulted in healthy or in syphilitic children according as the father was or was not kept under specific treatment. Maternal descent may arise through infection of the mother prior to conception, infection of the mother at the moment of conception, or infection of the mother during the period of utero-gestation - postconceptional infection. Regarding infection of the mother previous to conception, there is little difference of opinion. Even those who claim the most for paternal influence include among the condition which may give rise to syphilis in the child disease of the ovule, and it may be stated as incontrovertible that recent or active syphilis in the mother at the time of conception will almost certainly be followed by syphilis in the child. As a rule, women who have borne syphilitic children, even when they do not give unmistakable evidence of the disease, fail in health, become anaemic, and often develop glandular or osseous swellings which, according to Zeissl (Jahrbuch,Vol.ii.,1872,p.303), are only relieved by anti-syphilitic treatment. The bearing of Colles' law upon the alleged immunity in many instances of the mothers of syphilitic children has already been shown; and there is other evidence, not perhaps so conclusive, but strongly corroborative of the same view, namely, that their escape is only apparent, and that syphilis, either latent or active, always affects such mothers. There can be no manner of doubt that in every instance, at or about the time of childbirth, there are not to be found pathognomonic lesions if syphilis, nor do such lesions always make their appearance in cases where the period of observation is a short one; but it is claimed, with much show of truth, that prolonged and patient inspection of such patients will in time result in the discovery of some symptom which betrays the presence of the disease. The cases in which treatment of the father has resulted in healthy children, whereas without treatment he procreated only syphilitic children,

the mother being without either symptom or treatment, have been urged as evidence of the direct descent of syphilis from the father to the child without the intervention or participation of the mother. Doubt has been thrown upon them by those who uphold the contrary view; but after careful examination of the facts, one is constrained to admit that some of them, notably those of Kassowitz (Die Vererbung der Syphilis, Stricker's Med. Jahr.,1875,p.321) and Taylor (Arch. of Clin.Surg., Sept.,1876), are convincing of the facts that treatment of the father controlled the condition of the child, and that there was no evidence that the mother had syphilis. But we have seen that the only proof of the universal infection of mothers of syphilitic children is the law of Colles, and that in many cases the disease is for a long time latent or unrecognisable. Admitting for the sake of argument that this was the condition in the cases in question, it does not at all follow, necessarily, that because the mother had latent or hidden syphilis she must infect her child. Every case, even of active syphilis in the parents, is not handed down to the children, a certain proportion of whom escape, even when both parents are in the height of the secondary stage at the time of conception. (Fournier. - Op. cit.,pp.35-37). But the activity of the disease in the children, and even more the likelihood of its reaching them, are in direct proportion to its activity in the parents. A mother, therefore, who under the influence of active syphilis in her husband has given birth to two or three syphilitic children, and has herself shown no symptoms of the disease, may nevertheless have it in the latent from and have no strong tendency to transmit it. Consequently, treatment of the father will result in the procreation of healthy children, because it removes the active and efficient cause of their infection. To take another view of these cases is to assume that every syphilitic parent must hand down the disease to the children - an assumption which is at variance with innumerable facts. Continuing the subject farther, we may consider the other methods by which syphilis descends from the mother to the child, having seen already that it is beyond doubt that it may be handed down by diseases of the ovule due to syphilis acquired previous to conception, and having seen that there is a high degree of probability that the mother herself rarely, if ever, escapes the disease. The second method, or that in which the mother becomes syphilitic at the moment of conception, has already been sufficiently discussed. It is really, strictly speaking, an example of paternal heredity, as the resulting germ is syphilitic, not because the ovule of the mother was infected, but on account of the disease of the spermatozoid of the father. We have next to consider the influence upon the child of a syphilis acquired by the mother during some period of utero-gestation. That under those circumstances the child can become infected has been and is still absolutely denied by some competent observers. Thus, Bumstead and Taylor, (Op. cit.,pp.742, 744) base their denial, first, on the physiological fact (sic) that no interchange of cellular elements

between mother and father is possible, and, next, on the absence of satisfactory evidence of the occurrence of infection during pregnancy; Zeissl's case seems sufficient answer to the last assertion, and there is strong evidence that the first is without good foundation: the placenta is penetrated by the virus, says the last-mentioned observer, and does not play the part of a filter for the elementary particles of matter, which, so far as we know, represent the true active contagion of the disease, and, in the absence of direct experiments, which it would be almost impossible to institute, we may argue from the facts known to exist in certain acute infectious diseases in which there are very interesting points of resemblance. All that is necessary for proof of its occurrence, however, is freedom of both parents from syphilis at the time of conception, or, in other words, syphilis must have been acquired by both, - not alone by the mother, - after the beginning of pregnancy; and that syphilis in the child be unmistakeably prenatal, that is, not acquired by some accident during or after birth. Perusal of the numerous cases reported allows of no reasonable escape from the conclusion that in some manner the poison of syphilis finds its way from the mother to the child. The old idea that the latter was directly infected in utero from the semen of the father is altogether without foundation. Other cases equally satisfactory have frequently occurred, and, unless the intelligence and veracity of the observers be impugned, they establish the fact that it is possible to have infection during the period of utero-gestation. In some of the reported cases contagion of the mother seems to have occurred in the seventh month of pregnancy, which is perhaps the latest date it can be communicated to the child. The exact date at which it becomes impossible to transmit the disease is unknown, but, as a general rule, it may be said that the earlier a mother is infected during gestation the less likely is it that the child will escape. Treatment of the mother, - as of the father in cases where he is at fault, - very greatly modifies the whole problem, and adds enormously to the probability that the infant will not be infected. Under the heading of hereditary syphilis we cannot properly include direct infection of the child during birth. There is no possible reason why, when the mother has contagious lesions of the genitals, acquired too late to infect the child in utero, this should not occur; but, as a matter of fact, it is the rarest possible thing to come across a genuine instance. One explanation of this circumstance may be found in the protective covering of vernix and mucus which coats the infant's body and lessens greatly the risk of absorption. This hardly accounts satisfactorily, however, for the absence of such cases from medical literature; and it is fair to suppose that in all but those cases in which the primary sore is acquired during the last month of gestation, - which for obvious reasons are exceedingly rare, - the infant acquires some immunity which protects it from its mother, and is similar to that which, under Colles' law,

operates in her favour. In other words, even though apparently free from syphilis at birth, - a not uncommon event, - it has a latent or modified syphilis which protects it from contracting the disease.

From what has just been said we may take it, then, that after a certain period, certainly not less than four years, and only after treatment of the most approved and assiduous lines has been instituted, a person who has contracted syphilis, not of a specially severe of malignant type, may be allowed to marry. The consent to this course will then be based upon a belief in the curability of the disease or the cessation of its contagiousness, its inoculability, and, in the vast majority of cases, its transmissive power at the end of the secondary stage. The affection may be inherited from either parent or from both, and the probability that this will occur increases in a direct ratio with the nearness of the time of conception to the date of their becoming syphilitic. The severity of the inherited disease in the child increases in the same proportion. It is certain that, the father being healthy and the mother syphilitic, the child may, and in all probability will, have the disease. (Sturgis, who disbelieves altogether in the possibility of paternal heredity, after examining the subject carefully, concluded that a mother begets non-syphilitic children as long as she is not infected, even though the father is syphilitic: and that the moment she is diseased the children are inevitably so (The Etiology of Hereditary Syphilis, New York Med.Jour.,July,1871). This doctrine was previously supported by Cullerier, whose views gave rise to the remark of Voillemier (Cited by Fournier) that if they were accepted "the father would be only the accidental occasion of a child: one would be, in reality, the child of his mother only." Cullerier's cases are invalidated by the fact that the syphilitic fathers who have had healthy children had been subjected to mercurial treatment (Mèm. de la Soc.de Chir.,Paris,1854, cited by Taylor in Arch.of Clin.Surg.,Vol.i.,p.83). The theory is a very old one. Vassal has sustained this idea as long ago as the end of the eighteenth century; in 1804 Kostum, and after him Hufeland, were of the same opinion. In 1857 Cullerier said that in order that a child acquire syphilis hereditarily it is necessary that the mother is or has been syphilitic. Ten years later Notta, Charrier, Mirreur, and, in 1873, Langlebert supported this theory more or less earnestly. In the last-mentioned year Oewre affirmed that paternal influence is nil as regards hereditary syphilis. Six years later Isseff contended that where a man suffers or has suffered from syphilis he cannot transmit the disease to his descendants without infecting his wife; that is to say, in fewer words, there is no infection from the father. In the opinion of Sigmund, the heredity of syphilis is derived in its last analysis from the mother (Nouv.Dict.de Mèd. et Chir.,Vol.xxxiv.,p.689). It is probable, but less so, that, the mother being healthy and the father syphilitic, the child will be infected. This refers to the comparative probability of infection, and does not conflict with the

statistical fact, expressed by Hutchinson (Op. cit., Vol.i.,p.431), that, "In the large proportion of cases met in practice the taint is derived from the father only." This numerical predominance of paternal influence is very readily explained. There are many more syphilitic men than syphilitic women, and especially among the couples who contract fertile marriages the number of women who are infected before becoming mothers is inconsiderable. On the other hand, it frequently happens that men who have had syphilis, but have been without symptoms for a longer or shorter interval, marry and transmit to a series of children a disease which has ceased to be directly contagious to their wives, the transmissive power continuing after the possibility of ordinary contagion has disappeared. As in the majority of such women the disease is latent, and may only be displayed in their immunity from infection, it becomes evident that, history and symptoms both being wanting on their part, the conditions justify the assertion of the syphilographer just mentioned. His above-quoted assertion, however, has been thought by several writers to indicate his belief in the escape of the mother. That the contrary obtained is evident from the following extract from his article in the "British and Foreign Medico-Chirurgical Review (Oct.,1877): "I take it for granted (although I know that there are still some who doubt) that it is possible for a father to transmit the taint, the mother at the time of conception being wholly free. I believe, indeed, that in practice this is by far the most common way in which syphilis is transmitted. Whether in these cases it is correct to speak of the inheritance being paternal only is, as we have just seen, another matter, since it is possible that in every instance the mother derives an infection from the father, and may thus in turn influence it." It is highly probable that, though it can scarcely be considered as proven, in all cases where a child becomes syphilitic through paternal influence the mother is also the subject of syphilis, which may, however, assume a latent form, the only evidence of its presence in a few cases being the protection which it affords against contagion through the medium of the child. The disease may be transmitted from mother to child even when it is acquired by the former as late as the seventh month of pregnancy. The most definite views which we possess on the subject of the hereditary transmission of syphilis are to the effect that children may be infected by heredity, not only when the two parents are syphilitic, but also when only one, either the father or the mother, is diseased at the time of conception. When both parents are diseased at that time there is more certainty that the child will be infected, and infected gravely, than if only one of them carries the specific disease. The hereditary affection is not always fatal, even when both progenitors have actual specific symptoms. The more recent the disease of the parents the greater the chances of their transmitting the malady and of its assuming a serious form. There is no proof that hereditary syphilis is more grave

when derived from the father than when proceeding from the mother. It is quite exceptional for the mother, healthy at the moment of conception, not to participate in the disease transmitted by the father to the child. If she escapes direct contagion, - which is rare when the disease of the father is active, - she undergoes a species of infection from contact with the contaminated infant. Syphilis by conception, which is thus transmitted from the foetus to the mother, may present the usual characteristics and evolutions of the acquired disease; frequently, also, it is latent, and is betrayed only by the existence of immunity from further contagion on the part of the mother. It may finally manifest itself by tertiary symptoms or by systemic troubles without specific characters; this form of syphilis shows itself in the mother in three ways - either by the usual signs of syphilis by contagion, with the exception of the primary sore, appearing about the sixty-fifth day after conception; by appearing at a later date as secondary or even tertiary symptoms, and preceded merely by a little disturbance of the general health, unhealthy hue of the skin, alopecia, etc., but nothing specific; or by showing itself some years afterwards in a tertiary form, having in the meantime given no indication of its existence save only in the protection it afforded against contagion from the child. The power of transmitting syphilis hereditarily decreases spontaneously as the disease of the parent becomes older. The influence of treatment is no less certain than that of time. When the two progenitors are at the moment of conception free from syphilis, the foetus may still be infected if the mother acquire the disease during the period of utero-gestation.

CONTAGION.

The syphilographers of old attributed the disease to more or less fantastic causes, but soon ascribed the malady to the element of contagion in every case. At the outset of their observations they were of the opinion that contagion might take place at a distance, and for the reason, as pointed out by Almener, that religious persons not infrequently manifested syphilitic symptoms, which obviously could not be due to an erotic cause. In 1530, Frascatororius affirmed in his famous poem that contagion at a distance was impossible, that is, the affection was not air-borne as formerly supposed; and, a score of years afterwards, Vidius and Fernel eloquently confirmed his views. About this time, and mainly owing to the advocacy of these observers, the theory of contagion was generally accepted - not only as regards sexual intercourse, but any kind of contact, whether direct or indirect, suckling, fomites, and heredity. The influence of the latter was denied by Hunter (Op. cit), and the contagiosity of secondary lesions was objected to by various suthorities of note. Nevertheless the accumulation of evidence upset all such negations, and at the present day all are agreed as to the eminently contagious nature of the disease.

Sources of contagion.

BLOOD.

During the primary and secondary stages of syphilis the blood is contagious. Hunter, however, denied this, and said that if the blood could produce syphilitic inflammation in a healthy wound, no patient who had venereal matter in circulation, that is, who suffers from constitutional syphilis, could, under certain circumstances, escape a venereal ulcer: every time he was bled, or scratched with a pin, the small wounds thus produced would develop so many chancres. But he failed to test his theory by proceeding to inoculation of the blood; and it remained for Waller to do this. In the presence of several physicians and others of note and responsibility, he, in 1850, inoculated a boy in his teens with the blood of a woman known to have secondary syphilitic lesions. A month afterwards, tubercles were seen at the sites of the inoculation, and secondary phenomena were observed in usual course. The experiment was successfuly repeated by Gilbert (Treatise on Skin Diseases and Syphilis). According to Lasègue (Arch.Gèn.de Mèd.,T.i.,p.603,1858), six years later there came to the knowledge of the Palatinate Medical Society the fact that a physician, - who for obvious reasons did not wish his name to become generally known, - had inoculated nine healthy persons with secondary syphilis, three of them subsequently becoming syphilitic. Similar experiments were performed by Pellizzari (Gaz.Hebd.de Mèd. et de Chir.,1863,p.349) and others which definitely established the mooted point. Even after all the inflammatory phenomena of syphilis have disappeared, the blood may carry contagion.

MATERNAL MILK.

The earlier writers on syphilis maintained that the milk of syphilitic mothers was contagious, though quite as many of equal authority insisted that it was not. Assertions to either effect were not lacking, but the actual proofs were open to objection. At the present day the milk is not considered capable of transmitting the disease. Hutchinson says that if it were, the malady would be more common than it actually is, while Power (Ency.Med.,Vol.xiii.) maintains that it is quite harmless provided that there is no contamination of the mammary glands. Even during the most active stage of the disease, it would appear that the normal secretions (this and the sweat and the semen and the saliva) cannot hand on the affection, provided they are not mixed with a discharge from some of the inflammatory syphilitic lesions. It is possible that, in the passage of the blood-serum through the glandular structures there occurs a straining out of the infectious material.

SALIVA.

Provided it does not come from a mouth affected with syphilitic lesions, this secretion is not infectious. Bloch (Sexual Life of Our Times, 1908), however, insists that the normal secretions of syphilitics in every stage are infective, and he cautions his readers against the contrary view.

SEMEN.

The ancient syphilographers regarded the semen as highly contagious, but since Hunter's time this view has been abandoned, despite a few authorities who endeavoured to establish the old-time theory to the opposite effect. Nevertheless, we must bear in mind that, though the semen cannot transmit the disease, per se, it must contain the virus of syphilis in some form, since it is able to infect the embryo, and by this means the organism of the mother.

PERSPIRATION AND TEARS.

These normal secretions, as we have seen, are not infectious.

LESIONS.

All are agreed that contact with the syphilitic poison in any way is required for the production of the disease. No matter where the site of inoculation may be, the affection is produced. The primary lesions are eminently contagious, as everyone of experience must allow. The same is true as regards the secondary lesions, though some are more contagious than others, especially the mucous patches. The more the lesions discharge the greater the liability to infection. So far as we are aware, after the primary and secondary stages of syphilis, both the blood and the discharges from the lesions are incapable of transmitting syphilis. The tertiary stage is therefore innocuous, and this is usually reached at the end of two years. After three years, contagion is almost unknown; and we have it on the authority of Hutchinson (loc, cit.) that there is no recorded instance of its having taken place after five years. Still, many years after the syphilitic poison has become innocuous, inflammatory lesions may be observed. The primary lesion at the site of inoculation is invariably a chancre, whether the contagion be derived from the secretion of a chancre, from that of a mucous patch, or from the blood of a syphilitic person. I t is only in the hereditary and the conceptional forms of syphilis that the starting-point of syphilis is not a chancre.

Modes of Contagion.

GENERAL CONSIDERATIONS.

We have seen that syphilis cannot be propagated by means of the air, and that the earliest and most usual form of transmission is by direct contact with the person suffering from the disease. Provided the conditions be favourable, there then occurs a prompt and direct passage of syphilitic poison from the tainted to the sound individual. This form of contagion is termed "immediate," in the contradistinction to transmission by some intervening carrier in the "mediate" method. The break in the skin or mucous membrane necessary for the entrance of the poison may be very minute, even, it is said, of microscopic size, but it nonetheless furnishes an open door for the entrance of the casual agent of the dreaded disease. There is , however, good reason to suppose that on the mucous membranes the virus can gain access independent of a solution of continuity of such structures, the casual agent, once implanted and

allowed to remain undisturbed, especially if located in an mucous or submucous follicle, finding its way through the underlying structures into the deeper tissues.

SEXUAL INTERCOURSE.

But in the vast majority of instances, - probably in at least 70 per cent., - syphilis is acquired by sexual intercourse, this method being recognised as the important one from the time of the fifteenth century epidemic owing mainly to the advocacy of Benedictus and Aquilanus (Gruner's Aphrodisiacus,p.63). In the fifth year of the sixteenth century, Catansus insisted that coitus was the chief cause of the affection, and from thence lues venerea was the name applied to the disease. The fact being generally allowed, it seems unnecessary to further insist upon this agency of propagation. During the act of coition there are peculiar facilities afforded for the contraction of the malady in the intimate approximation of delicate and easily abraded surfaces of the parties in a state of intense hyperaemia and receptivity. According to Bramwell (Atlas of Clinical Medicine), it is not unlikely that the virus may be communicated during coition by a person who remains unaffected to another individual.

KISSING.

Syphilis is not necessarily a venereal disease, it being possible to communicate infection in other ways than that just described. The commonest seat of infection, next to the genitals, is the mouth, especially the mucous membrane of the lips; and in the great majority of instances the contagion is accomplished by means of the local secondary lesions communicated from the syphilitic to the healthy mouth in the act of kissing. The ancient syphilographers recognised this source of of contagion and recorded innumerable instances. So long as the public are kept in ignorance of the possibility, so long will this etiological fact obtain. According to Sturgis (Amer.Jour.Med.Sci.,Jan.,1873) chancres of the lips are observed in about 3 per cent. of cases.

SIMPLE CONTACT.

Paracelsus, Fernel, and some of the ancient syphilographers recognised this as a cause of the propagation of syphilis, and affirmed that lying with an infected person alone would suffice for the transmission of the disease. Blègny (loc. cit.,p.16), for instance, said that, "To lie with a syphilitic, and to come in direct contact with him when he is sweating, or when he has ulcers or pustules on the skin, is a thing which may be regarded as dangerous, especially for those whose pores are open." Swediaur (loc. cit.) cites an interesting case, namely, that of two little healthy girls who had ulcers and herpetic lesions upon various parts of the body, without any syphilitic lesions about the genitals, undoubtedly arising from their having slept with a female servant of known specific taint. Sydenham (loc. cit.) says that he saw numerous cases of children becoming syphilitic from occupying the same bed with their diseased parents.

PROFESSIONAL DUTIES.

The preceding paragraph is also instances in the frequency with which physicians and midwives are affected in the course of their manipulations on syphilitic patients, the obstetric finger being the usual mode of inoculation. The literature contains several instances, some of them coming from very early times. Vercelloni must, however, have been exaggerating when he said that he knew a young man who, being afraid to have connection with a syphilitic prostitute, thought that he might safely touch her; he did so and contracted the disease.

INSTRUMENTS.

Knives and other articles used in operations, without previous disinfection, have been known to transmit syphilis to healthy persons. Thus, one of the most famous surgeons of last century developed a chancre on one of his fingers which was accidentally cut during the course of an operation of a syphilitic patient.

CIRCUMCISION.

Hutchinson (Syphilis) tells of an outbreak of syphilis amongst Jewish children who had been circumcised by a priest, in this case a contaminated piece of lint being responsible for the affection observed.

CUPPING.

It would seem that this used to be a common mode of contagion, as witness the 1577 epidemic of syphilis in Brünn, in Moravia, which was traced to the cupping undergone by several persons at the hands of the corporation bath attendant. Other outbreaks from the same cause have since been recorded, in all of which the blood is assailed as the cause of the phenomena noticed.

TATTOOING.

The possibility of this origination of syphilis is worth bearing in mind in view of the present craze amongst the fashionable, idle or fanatical for permanent or indelible adornment of the person by surgical means. Numerous cases have from time to time been reported that place the possibility beyond all doubt.

VACCINATION.

The possibility of syphilis being conveyed by vaccination was mooted many years ago; but, partly owing to reliance on certain theoretical tenets, and partly because of the utter harmlessness of vaccination, the profession fought the suggestion without properly investigating it. In regard to syphilis, the broad assertion was maintained that two infectious diseases could not affect an individual at one and the same time: either syphilis would be communicated alone or vaccina alone; moreover, it was affirmed that the juices of a syphilitic person were not capable of giving rise to the disease by inoculation unless they happened to proceed from a syphilitic lesion. There was never sufficient basis for the former of the two doctrines, and the latter received a rude shock when it was shown by Pallizzari and the anonymous physician of the Palatinate that the blood of a syphilitic subject was capable of conveying the taint. Meantime, certain horrible outbreaks of syphilis were reported, chiefly in

Italy, that could only be reasonably imputed to the ordinary occasions of syphilitic infection. Even these occurrences, however, failed to shake the general incredulity, especially in this country, where for long men's orthodoxy in medical matters was gauged by their obstinacy in refusing to investigate, far less believe, the slightest proposition unfavourable to vaccination, and where also observations far beyond the limits of the Empire were looked upon as in all probability fallacious. To a French physician, Viennois, we are indebted for the first systematic and fair-minded study of the subject under consideration. He demonstrated that the Rivalta cases and those of other like outbreaks were certainly due to vaccination; but he concluded that they owed their occurrence not necessarily to the use of lymph from syphilitic subjects, but to the fact that that lymph contained blood. By this time it had come to be recognised that syphilis was inoculable by the blood. But even our author's recudite disquisition failed to make any noteworthy impression beyond the concession that syphilis might possibly by conveyed in vaccination, but that, if it were, the catastrophe might easily be escaped by avoiding the use of lymph contaminated with blood, and that, therefore, the danger was practically no danger at all, as no one in this country would think of using a mixture of blood and lymph for the operation. In all this other English-speaking physicians throughout the world emphatically agreed. It is proper to add, however, that Ballard of London did his best to present the matter in a proper light in this country, and that it was largely due to his labours and those of Jonathan Hutchinson, - the latter of whom supplemented Ricord's discovery that vaccine lymph is never free from blood with abundant clinical evidence of the existence of vaccinal syphilis unavoidable by the mere observance of Viennois' safe-guard, - that we are now freed from the clog of error in this matter. Nor was it in this country alone that physicians so long baffled the recognition of the truth; for Jules Guèrin and his adherents in the French Academy fought desperately against it. We now know quite well that syphilis is liable to be communicated in vaccination, and that, too, without regard to visible blood in the lymph employed. There are two ways of avoiding it. One is to use non-humanised lymph, since the lower animals, with the exception of certain apes, are insusceptible to syphilis. The other is to select a human vaccinifer that is free from syphilis. This is difficult. Too great reliance, however, should not be placed upon the vaccinifer; it is possible to convey syphilis even in the use of bovine virus. Suppose two persons, A and B, are to be vaccinated at one sitting, A being syphilitic. If A is vaccinated first, and the same lancet, imperfectly cleansed, is used on B, it is plain that B will be inoculated not only with vaccine lymph, but also with A's blood. It is of the first importance, therefore, that this form of vaccinal inocculation of syphilis should be carefully guarded against; and that can be accomplished most certainly by

using a fresh instrument for each child operated upon. It is very necessary to bear in mind, from a medico-legal point of view, that constitutional syphilis may follow vaccination, and yet have nothing to do with it. Suppose an infant be born syphilitic, but with no visible manifestations of the taint. Let that child be vaccinated, and let the syphilitic dyscrasia afterwards break forth.. The ordinary inference would be that the syphilis was due to the vaccination; and in most instances this view would certainly be urged by the syphilitic patient, since it would free him from suspicion. It is always easy to disprove such an allegation, however, for syphilis communicated in vaccination always shows itself in the form of a chancre at the side of the vaccination. Therefore in any given case, unless this mode of onset can be proved, the syphilis is manifestly not of vaccinal origin. Some observers of the past, it is true, were of the opinion that vaccination may evoke a pre-existing syphilis, to use Lanoix's term, that is, that it may hasten the appearance of the characteristic manifestations, and even determine their localisation at the site of the vaccinal inoculation. But, even allowing the truth of that proposition, in such a case the lesion would be constitutional, not of the nature of a primary syphilitic induration. But is it desirable to take precautions against being placed on the defensive in this way; and it may commonly be avoided by declining to vaccinate infants under three or four months old, since inherited syphilis generally manifests itself by that time. This prudence on our behalf should not be carried too far, however, in case it lead us tp deny the benefit of vaccination in very young infants whenever the prevalence of smallpox is such that they are in obvious danger of exposure to and contracting that disease.

WET-NURSING.

The custom of employing a wet-nurse has been a fruitful source of syphilis, its possibility being first pointed out by Torella. The virus is conveyed during the act directly to the lips or other parts of the mouth, where a chancre appears in usual course. Probably there must be even more instances of the poison being communicated from the mouth of a child with congenital syphilis to the breast of a healthy nurse than where a nurse with syphilitic lesions of the nipple inoculates the mouth of a healthy infant. It is especially in countries where the custom prevails of having infants reared by nurses in the country that numerous cases have for long been recorded in which syphilis has been widely spread through a single diseased nurse or a single syphilitic infant. Consequently, a wet-nurse should never be engaged until it become certain that she is, and has always been, quite free from syphilis in every form. Furthermore, the disease used to be transmitted through the custom, now almost obsolete, of drawing out the nipples of women, either just before delivery or immediately after, by sucking them, or by emptying them in this manner when distended with milk. In former times a class of women made this

their special business, and in the works of the ancient syphilographers this is mentioned as one of the commonest causes of the propagation of the disease. The possibility is so obvious, indeed, that it need not be further urged; and the strict examination of all candidates for the position of wet-nurse is a precaution that it would be morally criminal to neglect.

KITCHEN UTENSILS, &c.

These come under the heading of mediate contagion, the contagion of the disease being conveyed not by direct surface contact, but by means of spoons, glasses, pipes, clothing, and so forth. On these the specific poison is deposited by a person suffering from syphilitic lesions; and from them the affection is inoculated in some solution of surface continuity in the case of non-immune or healthy individual. Amongst the articles which may be thus accused are drinking-cups, tobacco pipes, cigars, razors, postage stamps, books, linen, surgical and dental instruments, handkerchiefs, articles of clothing, and various other subjects. The use of a privy or water-closet after a syphilitic person has also been accused of transmitting the disease; and another, formerly common, instance of this kind may be found in the passing of the blowpipe from mouth to mouth in glass factories. A surface break in the tongue or lips will lead to the inoculation of the specific virus should the healthy person use the tube after a syphilitic individual. Various improvements in the manufacture of glass have taken place, so that a case of syphilis of this origination is nowadays extremely rare.

INSECTS.

There is no reason why syphilis should not be transmitted by means of insects and lice, just as they may do in the case of other affections.

BACTERIOLOGY.

It is in the bacteriological field that one must search for the causal agent of syphilis, though in the past, as we have seen, other directions were investigated, no less than one hundred and twenty-five causes, according to Lassar (1905) having been discovered during the last quarter-century, which is an eloquent testimony of the etiologist's assiduity and perseverance. Long before the discovery of the specific cause of syphilis it was thought that a microorganism was responsible for the disease, as so many of the clinical manifestations of syphilis could only be readily explained on the acceptance of such a theory, and analogical reasoning justified this conclusion. The disease was included amongst the infectious granulomata on account of the infectious course it pursues, the development, pathological anatomy, clinical phenomena, and ultimate termination of its lesions. It was therefore classed with leprosy, tuberculosis, glanders, lupus vulgaris, actinomycosis, etc., all of which affections are known to be inoculable, with the constant presence of bacteria in their lesions, and in some, as tuberculosis and glanders and actinomycosis, the definite establishment of a microorganismal cause. The origination of

syphilis in the same manner was therefore taken as proved.

KIRCHER AND ABERCROMBY'S OBSERVATIONS.

The history of the active research for the organism of syphilis really dates back to the year 1658, when the above-mentioned observers published a discovery of a contagium animatum (vermiculi).

DEIDER'S RESEARCHES.

In the year 1728, Deider described his "vers vènèriens" as the specific syphilitic poison.

HUNTER'S EXPERIMENTATION.

We have seen that it was largely owing to the patient investigations of this famous syphilographer that the eminently contagious character of syphilis was recognised (1810).

DONNÈ'S ORGANISM.

The use by Donnè, in 1837, of an improved type of microscope led to his discovery of the vibrio lineola in the pus of buboes, chancres, and balanitis. Though he considered the presence of this organism as accidental, it has since been suggested (Rille) that it was the spirochaete refrigens which he observed.

HALLIER'S MICROCOCCUS.

Hallier claimed, in 1869, to have established the real cause of syphilis, which he referred to the presence in the blood and pus of syphilitic subjects of the coniothecum syphiliticum, a cultivated form of the micrococcus which he originally observed.

KLOTCH AND BRUNEKENS' ORGANISMS.

Each of these observers claimed to have discovered the cause of syphilis in the respective bacteria which they described. They were, however, shown to be accidental and in no way specific.

SALISBURY'S FUNGUS.

In 1868, Salisbury brought forward his filamentous fungus, which he termed the krypta syphilitica; it developed from spores and was found in the blood on the development of the constitutional syphilitic phenomena.

LORSTORFER'S SYPHILITIC CORPUSCLES.

In the year 1872 came forth Lorstorfer with his discovery of syphilitic corpuscles in the blood of syphilitic persons; but it was soon seen that they were without etiological interpretation.

CUTLER'S FILAMENTS.

Six years later, Cutler published his finding of changes in the leucocytes and mycelial filaments in the blood-serum of syphilitics.

KLEBS' HELIOCOMMONADEN.

The next year Klebs found red-like motile bodies, to which he gave the above name, in the tissues of syphilitic subjects. On cultivation these developed into spiral masses. His researches were successfully repeated by Bermann.

MARTINEAU AND HAMONIC'S EXPERIMENTS.

In the same year these observers claimed to have produced syphilis by the inoculation of a pig with bacteria and micrococci from syphilitics. The value of their discovery was, however, disproved by Koch.

PISAROWSKI'S ZOOGLIAE.

In 1880, this author found in syphilitic tissue a finely-granular, zooglia-like mass, consisting of small rounded particles which, according to him, developed into the red-like organism seen by Klebs.

LUSTGARTEN'S BACILLUS.

In 1884, consequent on the discovery by Lustgarten of a characteristic bacillus, it was thought that the mystery of the causation of syphilis was solved. This bacillus was found by its discoverer (Wien.Med.Woch., 1884,p.47) on staining syphilitic tissues by a special method of a complicated sort and requiring special attention to details. Thin sections of the part to be examined were made through the border of the lesion, including, if possible, sound as well as syphilytic tissue. These sections were placed in a solution consisting of 100 parts of aniline-water, and 11 parts of a concentrated alcoholic solution of gentian violet, and allowed therein to remain for twenty-four hours. The temperature of the solution was then raised to 40 C., and the immersion continued for two hours longer: after which the sections were removed and placed in absolute alcohol for five minutes. On removal from this, they were dipped for ten seconds in 1½ per cent. solution of permanganate of potash, and then decolorised in sulphurous acid largely diluted with distilled water. If, after a thorough attempt, it was seen that decolorisation of the specimen could not be thoroughly effected, the process of washing in alcohol, permanganate solution, and a stronger solution of sulphurous acid was repeated. The section, when ready for mounting had to be colourless to the naked eye. When the decolorisation was complete, the section was washed in distilled water, cleared in the usual way with clove-oil, mounted in glycerine or Canada balsam, and examined under the microscope with an oil-immersion lens. De Giacomi (Baumgarten's Jahr.,1885,p.96) modified this stain by immersing the cover-glasses in hot aniline-water-fuchsin solution for a few moments, or sections in the same solution, cold, for twenty-four hours, after which they were immersed first in a weak, and then in a strong solution of perchloride of iron. After being washed in alcohol, the sections were dehydrated and clarified in the usual way. On examination, the syphilitic tissues thus stained were found to contain bacilli, each one being from 3 to 7 micromillimeters in length, or about the size of the tubercle bacillus. The organism has a slightly curved or S-shaped appearance, and knob-like enlargements at its end. In the tissues and secretions of chancres and moist papules, in dry papules, mucous patches, gummata, condylomata, and lymphatic glands these bacilli are to be found. They are not numerous, usually being found alone, or in groups of 2 or 3 to 8, somewhat resembling, but larger than, the leucocytes of the blood. They are usually found near the advancing border of the lesion, and not very often within its substance deeply. The question of the specificity of this organism was never proved; and the

idea of its being the causal agent of the disease was largely negatived by Matterstock (Mitth.med.Klin.Wurzb., 1885), Alvarez and Tavel (Arch. de Phys.norm. und Path., 1885), who showed that preputial and vulvar smegma, taken from healthy individuals, commonly contained an organism similar in form and tinctorial reactions; indeed, the similiarity of the numerous varieties of the smegma bacillus to that of Lustgarten was soon noticed and then generally believed responsible for his findings. In a general way Lustgarten's bacillus resembled the tubercle bacillus of Koch, to which it also corresponded in its indifference to aniline dyes, though much less strongly acid-fast. The bacillus is, wherefore still somewhat of a mystery, though probablythe tubercle organism, elsewhere than in or about the genitalia; in the latter locality it was in all probability the smegma cabillus which Lustgarten observed. The organism was never cultivated not successfully inoculated into animals, and the researches of others have given contradictory results, some finding it in all the cases examined and others in none at all. In view of later discoveries, presently to be described, it is so longer considered the casual agent of this disease.

DISSE AND TAGUCHI'S BACILLUS.

These observers were next in the field with a peculiar bacillus which they discovered in abundance in the blood of syphilitics, the specificity of which was, however, never seriously entertained.

NEUSSER AND GOLLASCH'S CLADOTHRIX.

These authors discovered a cladothrix, to which the same remark applied (1894).

VAN NIESSEN'S BACILLUS VENERIS.

Four years later, Van Niessen described his discovery of a pleomorphous bacillus, - the bacillus veneris, - in the blood and tissues of syphilitic subjects; in several cases a pure culture was obtained. The collected blood was allowed to coagulate in sterilised tubes, and the cultivation effected from the separated serum. This bacterium was motile and possessed of flagella, stained with Gram's and other reagents, and grew on all ordinary media. No one, however, has ever confirmed his results.

DOEHLE'S ORGANISM.

Doehle was , in 1892, one of the first to mention protozoa in relation to syphilis, he describing small protoplasmic bodies in stained syphilitic tissues not unlike those which he had previously isolated from the discharges. They were stained with a mixture of haematoxylin and carbolfuchsin, then immersed in iodine, and washed in alcohol. T he usual forms were round or oval, sometimes with irregular outlines, and flagellated. Small excised fragments of gummata and other syphilitic tissues were placed beneath the skin of guinea-pigs, with the result that they forthwith became marasmic and ultimately died, and, in his opinion, established the specificity of these germs. But they are also found in the febrile stages of measles, scarlatina and variola, and no specificity can reasonably be claimed.

KREMER'S ASPERGILLUS.

In 1896, Kremer wrote regarding the syphilis aspergillus in the etiology of syphilis.

MIXED INFECTIONS.

About the same time Tarnowsky mentioned mixed infections in connection with this subject.

PAULSEN'S BACILLUS.

In 1901, Paulsen described the finding of acid-fast bacilli in the blood of syphilitic subjects.

JOSEPH AND PIORKOWSKI'S ORGANISM.

In 1902, these observers reported the discovery of an organism in syphilitic semen which they considered specific. It could also be cultivated from the enlarged glands. Its specificity has, however, never been proved.

SIEGEL'S CYTORRHYCTES.

About this time came the announcement by Siegel that he had discovered small motile bodies, provided each with a single flagellum, which he named the cytorrhyctes luis. They were very similar to the bodies described by Dohle, and were seen not only in smears from syphilitic lesions, but also in the tissues and the blood of inoculated rabbits and monkeys. Though this observation did not receive confirmation from other observers, it seems to have given Schaudinn an inkling of the line his investigations should take.

SCHULLER'S PROTOZOA.

Max Schuller (Centralbl.f.Bakt.&c.,Bd.32,1902, p.432), after the examination of several syphilitic preparations, found two protozoa-like bodies. These he was able to demonstrate also in fresh smears from primary lesions, and he described them as occurring in the two forms of large capsules and young organisms. The former are usually pyriform or three-cornered bodies, of a brownish-yellow colour, the contents of same being of a darker hue, and the capsule of a glistening-yellow tint. Under the high power of the microscope small, knob-like elevations and nucleated masses of protoplasm are observed. The so-called young organisms are much smaller than these, and are radically constricted, light in colour, and of double outline. They appear to have developed from the large capsules.

DE LISLE AND JULLIEN'S BACILLUS.

These observers described a peculiar polymorphic and motile bacillus which they isolated from the blood of syphilitic persons. It disintegrates after the blood has undergone coagulation, and is agglutinated by the serum of syphilitics - a point which was urged in favour of its specificity.

THE SPIROCHAETE PALLIDA.

In the year 1905, Schaudinn and Hoffmann (Arbeiten aus dem Kaiserl.Gesund.,Bd.22,H.2,S.527; and Deut.med.Woch.,1905,No.18,S.711) claimed in no uncertain terms to have discovered the actual cause of syphilis which for so long had defied the efforts of the pains-taking observers mentioned before. Their astonishing announcement was made in a paper which they read on May 17th. before the Berlin Medical Society, accompanying

same with microscopical demonstrations. The characteristic organism in question was found in various syphilitic lesions, was distinct from all others previously observed, and occurred in the chancres of 7 cases, in the anal papules of 1 case, in the genital papules of 8, in 2 closed primary lesions of the skin of the penis, in 12 cases of inguinal bubo, and once in the blood drawn from the spleen. Metchnikoff, moreover found the spirochaete of these authors in the primary lesion of syphilis inoculated on apes. It may also be mentioned that, in 1903 Borrel and Gonjou found an identical organism in smears from hard chancres and mucous patches in the throat; Bordet reported similar findings in his laboratory in Brussels; but as the specificity of these organisms was neither claimed nor proved at the time, it was not until the publication of the researches of Schaudinn and Hoffmann that the proper etiological interpretation was accorded the spirochaete. Then the question was investigated almost everywhere, and by the end of the year there were forthcoming testimonies from all parts of the world in favour of the specificity of this organism. It was found in a great variety of syphilitic lesions - e.g., smears from the sections of chancres in all positions both entire and ulcerated, eroded and intact papules of the penis, anus, skin and elsewhere, in the syphilides, in the glands, in the blood of the general circulation and spleen, in tertiary lesions of all sorts, and in the cerebrospinal liquid. The Spirochaete was also discovered in cases of hereditary syphilis in the skin eruptions, in secretions of the mouth and nose, in the thymus, lungs, liver, spleen, kidneys, suprarenal capsules, lymphatic glands, bone-marrow, meninges of the brain and spinal cord, the cerebrospinal liquid, and in the placenta, as well as in the experimental syphilitic lesions of apes. It has never yet been observed in lesions that are not syphilitic, at least no genuine instances have been reported. It is true, however, that Kiolomenoglou and Cube and a few others claim to have found an identical organism in balanitis and other non-specific lesions; but Schaudinn and Hoffmann, on inspection of their sections, said that it was not the spirochaete pallida which they observed. In the opinion of Saling, the organisms seen in stained specimens are simply tissue fibrillae consequent on local inflammation and tissue necrosis occasioned by the disease; he arrived at this conclusion in view of the frequency with which smears of congenitally syphilitic organs were negative, whilst stained sections of the same organs showed the abundant presence of the spirochaete, which cannot be affirmed of any other microbe. His views, however, have been negatived on more than one occasion. According to Levaditi (Ann. de l'Inst.Pasteur,Jan.,1906), the number of spirochaetes present in a case of hereditary syphilis is in direct proportion to the severity of the disease. De Korte (Practitioner,June,1906), on examination of the blood in secondary syphilitic subjects, found bodies which Clarke (Protozoa and Disease) regarded as protozoa.

Stephenson (The Ophthalmoscope, March,1906) claims to have isolated the organism from a case of syphilitic corneal lesion. It has been proposed to alter the name "spirochaete" to "spironema," for the reason that the organism differs in certain fundamental respects from other spirochaetae; thus, Schaudinn was unable to discover an undulating membrane, and there appeared to be a flagellum at either end. It may here be noted that the spirochaete refringens is more refractile than the spirochaete pallida, is thicker and longer, has more open and less regular curves, and stains more readily.

Morphology. - The spirochaete pallida is curved in a spiral direction, rather long, delicate, and non-refractile. Seen with an oil-immersion lens, it is from 4 to 14 or 15 micromillimetres in length, the actual range of dimensions being about from 2 to 20. Both ends are pointed, and capped with a single flagellum, though in rare instances there may be more. The spirals, less defined towards the ends, are clearly outlines, sharp, tight and somewhat like a corkscrew; and they vary in number from five to perhaps thirty, - the usual being from five to twenty-six, - though short and thick specimens with only a couple or three curves have been occasionally observed. In breadth the organisms measure 0.25 mm., and the length of each spiral is from 4/5ths to 1 2/3 rds mm., a characteristic being the large number of spirals in proportion to the length of the germ. The general outline is generally slightly curved or S- or C-shaped; and when two organisms of the latter shape are in apposition, the appearance of a closed circle is simulated. In cross-section the outline is circular; and the terminal flagella are extremely fine and in length equal to four to six spirals of its body. It is a motile organism; and the motility is either a backward and forward movement, a snake-like or whip-like undulation of the whole body without locomotion, or rotation in the long axis. The application of some physiological salt solution will prolong the movements for six hours or so; but it entirely ceases under glycerine and is gradually stopped by exposure to the air. According to certain authorities, the organism is possessed of Brownian movements and nothing more. In the quiescent state the spiral outline is still preserved, this constituting an important distinction from other spirilla. Most observers are of the opinion that there is an undulating membrane, though one has not been seen, except perhaps by Schaudinn who stained with the Loeffler reagent. The highest powers of the microscope have been used for the discovery of a nucleus, but it is doubtful if the tiny points observed are of that sort. There are no spores, and the organism would seem to undergo multiplication, not by transverse division, but - like the trypanosomes - by longitudinal fission.

General Characteristics. - The spirochaete pallida, in smear specimens, is generally found lying free and unenclosed by a living cell, though it is not infrequently in close relationship to a red blood-corpuscle, touching it with one end and very often embracing it. Levaditi (loc. cit.) says that, though

the organisms may lie at a distance from one another, they may agglutinate and form clumps, sometimes actual tangles. Though involution forms have now and then been observed, very little, if anything definite, of the life history of the spirochaete is known; Schaudinn says that some of the oval and spindle-shaped forms are resting stages. The tinctorial obstinacy of the spirochaete pallida is one of its most prominent characteristics; for a tinctorial reaction is sometimes beyond securement, and in general the colour obtained is very faint. It absolutely refuses to respond to Gram's method. The organism, in sections taken through chancres, is seen to lie in the epidermic epithelium, in the lymph spaces, and in the thickened walls of the vessels. Levaditi is of the opinion that, after a stage of intravascular freedom, it enters the endothelium, and there excites the characteristic swelling and occlusion. Sections of organs in hereditary cases teem with the spirochaete; and, owing to its great abundance in the tissues generally, it is really regarded as being circulated in the blood-stream. It has been observed to undergo change and disappearance on the initiation of specific treatment, but the dependence of the one phenomenon on the other is still a mooted point.

Isolation.

The spirochaete pallida can be obtained for examination best perhaps from a chancre, after thorough asepsis and drying of its surface: otherwise the confusing spirochaete refringens, which abounds in such localities, will be obtained. Having thoroughly cleansed the part, the chancre should be gently curetted, and a drop of blood-tinged serum obtained and subsequently studied either in a hanging drop or a thin smear preparation. Any epithelium covering the chancre may be removed, or a drop of serum aspirated for the examination. The latter operation will do very well for securing serum from a syphilitic lymph node, and the same can be effected in the case of the syphilides by scraping away the protecting epidermis. Furthermore the serum may be obtained from blisters specially produced. For the examination of the blood it is advisable to adopt Noeggerath and Stachelin's method, which consists in removing 1 c.c. of that liquid and mixing it with ten times the amount of a 1/3 per cent. of acetic acid, the smears being taken from the sediment remaining after centrifugalisation of the mixture.

Tinctorial Reactions.

We have seen that the spirochaete pallida is very obstinate to staining; and this feature must always be borne in mind. Great attention to detail is also necessary, and the smears should be freshly prepared, or the stain will either not take or fade very quickly when effected. Drying in air will usually suffice for fixation, though some prefer to secure the best possible definition and a clear view of the tapering ends by fixing in a vapour of osmic acid; for this purpose it is merely necessary to hold the

preparation for a few seconds over the mouth of a bottle of crystals of the drug.

The following are some of the numerous stains proposed, most of them being used only by their advocates:

Wright's Stain. - This is for preparations of the blood, and consists of a mixture of methylene blue, eosin precipitate, and pure methyl alcohol.

Oppenheim's Stain. - The ingredients of this are carbolic acid and an alcoholic solution of gentian violet.

De Marius' Stain. - A reagent consisting of azur blue, methyl alcoholic, and eosin.

Levaditi's Stain. - The preparation is impregnated with nitrate of silver, and subsequently treated with the Giemsa stain.

Giemsa's Stain. - Although a tardy method, a modification of the Giemsa stain, and first recommended by Schaudinn and Hoffmann, gives the best results. The specimen, carefully obtained in the way above described, is immersed for twenty-four hours, after due fixation of course, in a fresh-made solution of Giemsa's azur-eosin (2.5 c.c.1 per cent. eosin to 500 c.c. water) 12 parts, azur I. (1 to 1000 water solution) 3 parts, and azur II. (0.8 to 1000 water solution) 3 parts. After washing with water, examination may be commenced. Romanowsky's modification of this stain is now generally preferred. This reagent is a mixture of azur II. - eosin 3.0 gm.,azur II.0.8 gm.,glycerine (merk,c.p.) 250.0 gm., and methyl alcohol (kahlbaum I.) 250.0 gm. After air-drying of the preparation and hardening in absolute alcohol, the stain is diluted with distilled water, - 1 drop of the stain to 1 c.c. of water, - for every examination a new dilution being effected. For not less than twenty-four hours must the specimen be allowed to remain in this diluted reagent: otherwise the results will be insignificant and uncertain. The spirochaete pallida is in this way stained a violet-purple, and the nuclei of the white blood-corpuscles a deep blackish-red; in the absence of this, the test has not been properly performed. As the spirochaetes are less numerous than in a hanging-drop preparation from the same source, it is not at all improbable that some of them do not stain at all.

Victoria-blue Stain. - Mere heating for a minute or two in Victoria-blue will stain the spirochaetes.

MacNeal's Stain. - This is a simple, rapid and reliable method, consisting of the heating of the specimen, on a cover-glass for forty-five seconds, after immersion in a mixture of crude methylene violet (.25), medically pure methylene blue (.10), yellowish eosin (.20-), and pure methyl alcohol (100.00). The preparation is then immersed in a solution of carbonate of soda (1 : 20,000) and moved about therein for two minutes, after which it is washed and examined in the usual way. The organisms take on a delicate blue, or become quite black if deeply stained.

Ramon y Cajal's Stain. - The best method for staining the spirochaetes in sections is Levaditi's modification of Ramon y Cajal's nerve-fibre stain. A 10 per cent. solution of formalin is prepared, and in it

small sections of syphilitic tissue are hardened for twenty-four hours, - after which they are immersed during a similar period in 25 per cent. alcohol. They are then taken out and washed in water prior to being placed in a fresh dilute solution of nitrate of silver; in this latter they remain for three days, at a temperature of 98.5 F., in the dark, and the solution is changed every twenty-four hours. Still protected from the light and at room-temperature, they are immersed for twenty-four hours in a solution of pyrogallic acid (2.0 gm.), formalin (5.0 c.c.), and distilled water (100.0 c.c.). The next thing to be done is to wash the specimens with water, dehydrate them with absolute alcohol, clarify with xylol, and imbed in paraffin. Mounting in Canada balsam may be done. The spirochaetes stain black, the nuclei green, and the connective tissue and muscular fibres an emerald hue.

Schaudinn's Flagella Stain.- Very thin smears of the syphilitic material are boiled in a solution consisting of 25 per cent. tannic acid (10.0) cold-saturated solution of ferrous sulphate (5.0), saturated alcoholic solution of fuchsin (1.0), and counterstain of Ziehl's fuchsin.

Recognition. -

Bushnell (Lancet,Dec.9,1905,p.1728) considers it quite easy to demonstrate the presence of the spirochaete pallida in primary and secondary syphilitic lesions; and he considers discovery of this organism of some importance in the diagnosis of the disease. It must, however, be remembered that this microorganism is but a single member of a considerable stimulating group, which may at times cause difficulty in diagnosis. This mainly applies in actual practice to the spirochaete refringens, which is not infrequently, as we have seen, present in certain syphilitic lesions, particularly in ulcerating lesions, smegma, venereal warts, in the mouth, and on the tonsils. But the delicate form of the spirochaete pallida, its slight refractility, its obstainacy to staining, and the number of its spirals will usually suffice for its recognition. In contrast to it, the spirochaete refringens is large, more refractile, easy of staining, has broad and wavy or undulating spirals instead of corkscrew ones, blunt and not pointed ends, more rapid movements, and occurs in remarkable abundance in smear preparations instead of in two or three or fewer members.

Classification.

The spirochaete pallida has been variously classified according to opinion or whim of observers. Schaudinn considers it a protozoon, and thinks (with Vuillemin) that it should be called the spironema - it being, he says, distinct from all other spirochaetes by its preformed spiral shape and the possession of flagella, and from the spirillae by having a single flagellum at either end and its multiplying by longitudinal fission only.

Specificity.

Although it is generally agreed that the spirochaete pallida is the causal organism of syphilis,

it is as well to bear in mind the numerous others that have from time to time, as we have seen, been so considered, and not to be blindly dogmatic in this particular, merely allowing that its specificity has been established with a probability bordering on certainty until the future places its etiological interpretation beyond all doubt. The opening for confirmatory and original research is undoubtedly a wide one. It will be necessary to demonstrate that the spirochaetes are found constantly in all at least of the earlier lesions. They must be removed from such lesions, isolated from all other species of bacteria, and pure cultures must then be made upon suitable media. From these cultures inoculation experiments upon individuals absolutely free from any taint or suspicion of syphilis must be made, with the result in them of producing demonstrable specific lesions. In the lesions of the syphilis thus produced the same microorganisms must be found. These are essentially Koch's postulates, and in the observance which they require alone can absolute proof be found. Only when this shall have been accomplished will the specific germ of syphilis be completely and unequivocally demonstrated. This has never yet been effected, though everything hitherto observed strongly points to the spirochaete as the one and only cause of the disease, and its value as a diagnostic agent appears beyond all reasonable doubt. In the past one of the greatest difficulty lay in the way of demonstrating the micro-organism of syphilis lay in the fact that animals were immune to the disease, and therefore the help afforded in the study of such affections as tuberculosis was denied. Numerous inoculations were tried and repeated time after time on almost every kind of animal, but always with negative results. Then came the announcement by Metchnikoff and Roux and Neisser, in 1904, that they had successfully inoculated apes with syphilis, and found the spirochaete in nearly every instance, though for some inexplicable reason the last-mentioned observer failed to find the organism in the viscera and blood of experimentally syphilised monkeys and in hereditary syphilis of these animals. The apes experimented upon were anthropoids and some of a lower order. Whilst the former could be inoculated in any part, the latter were susceptible to a primary lesion only if inoculated on the genitals or eyebrows (Kraus established the absence of the organism from the normal skin of these animals). In the chimpanzee the disease ran a typical course, showing a distinct secondary eruption of the skin and mucous membrane, while the lower order of apes merely showed a recurrence near the primary lesion; the disease therefore was most serious in animals nearest to the human species, and a variation of susceptibility was observed. The occurrence in man of malignant syphilis may be due to the same thing. No variation of virulence could be detected in the different apes, the disease always running the same course, whether inoculated for a short time or a long one, from primary sores or from internal organs. Our inability to manufacture an attenuated virus or vaccine is explained by failure to produce the disease from a syphilitic serum.

Experiments on monkeys have been confirmed by Grünbaum and Smedley (Brit.Med.Jour.,Mar.17,1906), as well as by others subsequently, not only by means of inoculation from human cases, but by transmission of syphilis from one ape to another. As the spirochaete pallida has never yet been successfully cultivated, it is impossible to reproduce syphilis by inoculation of the pure organism; Koch's third and fourth laws are therefore still unfulfilled, though in the case of the former this is not so important as malarial plasmodium, which is undoubtedly the cause of malarial fever, also refuses to respond to it. The organism is seldom absent from the primary and secondary lesions of syphilis, failure to discover it being most likely due to defective examination technique; both in their depth and in the blood it is found unmixed with other microbes. It is found most plentifully and most often in the most contagious lesions, e.g., chancres, mucous patches, and condylomata. It seems to have a special affinity for connective tissue and glandular epithelium; and it is seen in the internal organs, the syphilides, and the blood of hereditary cases. In the placenta and the umbilical cord, despite the remarkable absence of other germs, it has very often been found. In 1905, both Busghke and Tischer demonstrated the presence of the spirochaete in the organs of a congenitally syphilitic child, and about this time Levaditi did the same (Ann. de l'Inst.Pasteur,Jan.,1906). Two years later, Mc Intosh (Jour.of Path. & Bact.,1908,p.239) reported their finding of the organism in most of the organs of these cases, with a special location in the liver, due probably to the latter being the first organ interposed between the placenta and the circulation of the foetus. From the number of spirochaetes discovered in children's organs, the disease seems more of an acute than a chronic infection. It is generally believed that in the foetus the organisms are carried in the blood-stream to the liver, and from thence distributed throughout the system. They most likely find their way through the walls of the blood-vessels into the surrounding structures, and finally into the lymph spaces, lymphatic glands and ducts. Besides the liver, spirochaetes have been found in the syphilides, the lungs, spleen, and suprarenals of congenital cases. Non-luetic lesions never contain them; and the organism sometimes disappears under specific medication, even when the mother prior to delivery has been put on a mercurial course. Syphilitic sores in a state of healing contain fewer spirochaetes than those which are in the most active stage of their manifestation. It is impossible to pass the organism through a Ton-filter (Metchnikoff and Klingmüller).

We may finally note that Castellini(Brit.Med.Jour., Nov.18,1905; Nov.23,1907) has reported the discovery of a spirochaete in YAWS, which he and certain other observers regard as identical with the organism of syphilis. Maclennan and others have, however, disproved this assertion.

P A T H O L O G Y .

GENERAL CONSIDERATIONS.

It is generally agreed that the pathological anatomy of syphilitic lesion is, with very few exceptions, not distinctive. Histological examination of the lesions demonstrates, just as does the symptomatology, the initiative faculty of the affection. The structural features of syphilitic new-formations do not materially differ from those seen in a multitude of lesions due to other diseases. Yet here, as in their grosser features, these changes present some characteristic appearances which bear the imprint of syphilis and indicate their real nature. The gummy tumour is perhaps the most characteristic lesion of this disease. It may be seen early or late in its course. Microscopical examination of such a tumour in the earlier period of its development reveals a circumscribed or diffuse mass of embryonic cells enveloped in a gelatinous basement substance, and surrounded by a hyperaemic area. Epithelial and giant cells sometimes appear. The cells are of a low order of organisation, and exceedingly fragile. Within the hyperaemic zone first formed a free development of connective tissue takes place, forming an apparent envelope for the embryonic mass within. From this envelope connective tissue processes invade the tumour substance, and radiate into the surrounding tissues. Infiltration of the newly formed connective tissue with spheroidal and epithelioid cells takes place. New formed blood-vessels ramify freely in the mass, and there is a considerably increased flow of blood to the part. Enlargement of the neoplasm may be rapid or slow, and by peripheral extension. The lesion is therefore not essentially a tumour in which there is a new growth occurring, but a neoplasm arising from a hyperplastic inflammation and belonging distinctively to the granulation type. A gumma may disappear at any state of its early development by resolution, absorption of its products taking place, or it may and does most frequently undergo cheesy degeneration. When this happens, one or more necrotic points first appear within the substance of the nodule. These enlarge, become fused, and in time occupy the greater part of the tumour. The mass now appears as if composed of finely grated cheese pressed closely into a compact body. A wall of granulation tissue forms about the cheesy mass. This product of coagulation necrosis may be removed by absorption, or there may follow ulceration with destruction and sloughing of the nodule. Then there results a cicatrix. The frequency with which the process invades the vascular structures is a second feature of the syphilitic inflammation. The arteries show the specific inflammation in its completest development. As the result of the process, infiltration of the walls of the vessel,

with round or polyhedral cells, takes place, producing an appearance that has been likened to the arrangement of a coat-sleeve about the arm. This infiltration occurs chiefly within the perivascular lymph spaces and between the coats of the arteries. Considerable thickening and rigidity of the walls results. The process may be localised or extended throughout considerable areas. The product may be absorbed, but more often results in the formation of fibrous connective tissue, with the production of a limited arteriosclerosis. Early affection of the vessels in the immediate vicinity occurs. In view of its well-defined clinical aspects, the initial sclerosis ought to present definite structural features. This, however, is not the case. Its minute anatomy is not definitely characteristic. The changes portrayed are those liable to occur in any low grade of inflammation. There is an abundant development of small round cells within a more or less dense connective tissue stroma. The parts are freely invaded by leococytes. Giant and epithelioid cells sometimes occur. Proliferation of connective tissue elements takes place. The small blood-vessels entering the part display the above-described coat-sleeve infiltration of their tunics. This latter feature is continued along the vessels to some distance from the initial lesion. The newly formed connective tissue shows a tendency to persist unchanged for some length of time, but is finally absorbed. The induration of the chancre is caused by dense infiltration of the connective tissue spaces with cells, and by oedema of the corium and epidermal layers at the borders of the lesion. It is also probable that the syphilitic poison exerts a specific influence upon the lymph of the part affected, and that this action of the virus is partly responsible for the induration which takes place. The cells developing in any part vary but little in size at first, but later many of them become much enlarged and not infrequently show more than one nucleus in their substance. The earlier lesions of the external integument, such as macules and papules, present no structural features that distinguish them from the lesions produced by low grades of inflammation not syphilitic. There is congestion of the corium with exudation into its parts, and a resulting hyperplasia of the epidermis. Pustular lesions present a torn condition of the epidermal structures, with partial or complete destruction of the corium and a mingling of the products of necrosis with blood and leucocytes. They are indistinguishable from the pustules occurring in other affections. Lesions of the mucous membranes have the same features as those presented in like lesions appearing on the surface of the skin. The main structural alteration in the lymphatic glands appears to be infiltration of the vascular channels with spheroidal and epithelioid cells. A striking and characteristic feature of the syphilitic process is the free production of connective tissue. This occurs in connection with the development of many of the different lesions or as a result of their disintegration and resolution.

This tendency is particularly well defined in the nervous system, and especially late in the course of the disease. It is believed to have an important etiological interpretation in the production of locomotor ataxia.

SPECIAL DETAILS.

CHANCRE.

The primary or initial lesion of syphilis is known as the hard chancre, the Hunterian chancre, indurated chancre, syphilitic chancre, and the primary lesion. This will be found at the site of inoculation, which may be on any part of the body. Syphilographers mostly affirm that an abrasion or crack is essential at the site of inoculation; but Hutchinson (Syphilis) says that an abrasion is not necessary, only favourable. This view, however, has been severely criticised. Provided there occurs the contact of a syphilitic lesion with an abrasion, however minute, the deed is done; the abrasion need only be microscopic, the lesion unsuspected, the contact momentary. The development of a chancre at any given point is a consequence of the organism entering the system there; and after its local irritation it is carried by the lymphatics to the nearest set of lymphatic glands, which undergo enlargement and induration. But immediate action does not occur; for after the organism has gained entrance to the system there occurs an interval in which there is no appreciable sign of infection. This interval occupies from ten to thirty days. At the expiration of this incubative period, the hard chancre of initial sclerosis makes its appearance at the point where infection took place. The length of this incubative period varies within quite wide limits. Ten days appears to be the the shortest genuine time on record in which the date of infection was indisputable, while periods as long as sixty and seventy days have been from time to time reported. Very long and very short periods are exceptional, however, and always open to suspicion. The vast majority of chancres make their appearance at or about the end of the third week after the inoculation. The chancre develops just where the contact with the syphilitic poison took place, and never at a distance from this point. Two or more points may, however, be infected at the same time; and if this occurs, there will be an equal number of chancres resulting. Thus it may happen that an individual develops a chancre of the lip at the same time with one on the penis - the former being acquired by kissing, the latter through sexual intercourse with the same. It is not very often, however, that this occurs. It is generally believed that during this quiescent period the syphilitic organism does not remain localised and latent, but undergoes distribution and developmental changes of a rather cryptic sort. It is also believed that infection of the system occurs within a relatively short period after contamination has taken place. This is shown by the fact that, if an abraded surface or open wound through which the poison is supposed to have passed be thoroughly cauterised or deeply extirpated

within a few hours after inoculation has taken place, it does not prevent the development of a chancre or the appearance of constitutional symptoms in due course. The chancre is that changed condition of the normal or unsound skin or mucous membrane produced by infection with the syphilitic poison, and occurring at the point where such infection has taken place. It is characterised by a varying degree od induration and an accompanying enlargement of the neighbouring lymphatic glands. Ths synonyms "initial lesion" and "initial sclerosis" are much less confusing and coming more and more into general use. This lesion does not occur in the congenital disease; it is never absent in the acquired form. It may be so slight in its manifestations as not to attract the patient's attention, or it may be hidden deeply beyond the external openings of the body, such as in the oral cavity or vagina, and thus escape detection; but its existence is none the less certain. Cases of syphilis in which it was said to have been absent are simply instances in which it was overlooked or misunderstood. It is one of the few pathognomonic, constant and unvarying symptoms of the disease. The chancre is the first obvious lesion of syphilis after infection. The site of its appearance is always definite. It occurs at the point or points of infection, and in no other localities. It is usually single; but if there has been coincident infection at two or more points, there will be a corresponding number of initial lesions. This frequently happens on the glans or prepuce when the rupture of a number of herpetic vesicles has opened different passages for the entrance of the syphilitic poison. Here as many as twelve or more distinct and individual chancres may be seen, each presenting the typical characteristics of a hard chancre. The primary lesion of syphilis is not autoinoculable. The poison of the disease may be deposited upon the broken skin or mucous membrane of the individual upon whom it occurs, and no chancre will result. In this it differs from the chancroid, which can be freely inoculated at different sites upon its bearer. When the chancre appears upon a surface that is brought in contact constantly with an opposing surface it is apt to produce a lesion that looks as if autoinoculation had taken place. This happens frequently upon the inner surface of the prepuce and the glans penis, or between the lips of the vulva. If such secondary lesion be examined carefully, it will be found to be superficial, not at all indurated, and perhaps slightly ulcerated. It is caused by the irritation produced by the chancre, and not by any specific action of the syphilitic virus. A careful diagnostician can scarcely make a mistake in this respect. It has been found impossible to inoculate the specific virus upon an individual who has already had the acquired form of the disease; upon a person who has inherited syphilis from one or both parents (Profeta's immunity); and upon a mother who has borne a syphilitic child without showing in her own person any of the lesions of the acquired affection. The immunity against fresh infection

conferred by acquired syphilis is present in the earliest stages of the disease: usually from the first appearance of the chancre, and in some cases even before this. It persists long after syphilitic phenomena have disappeared, and it can be transmitted to offspring independent of the active virus. This is akin to what occurs in other diseases, and various facts show that the immunity in syphilis is due to the tissue-products of organised virus passing into the circulation of the affected individual. Profeta's immunity, - namely, that observed in the offspring of syphilitic parents, - is noted at times in children who exhibit no signs of congenital syphilis. In this case inhibiting tissue - products without the active virus are present in the circulation. This is also the case in Colles' immunity, in accordance with which the mother of a child syphilitic by its father cannot be inoculated with syphilis. The explanation of this fact depends either on the absorption of into the mother's blood through the placental circulation of only the tissue-products of the specific microorganism, the so-called antitoxins, or upon the fact that the mother is really suffering from latent symptoms, both the active virus and the tissue-products having been absorbed, but having been so modified by pregnancy that none of the ordinary phenomena of syphilis are seen. Despite the above-mentioned fact that syphilitic reinfection is most extremely rare, it would seem to occur in some few cases. In the great majority of those reported the symptoms could be more satisfactorily explained by regarding them as the result of a recrudescence of the original attack. Fournier maintains that reinfection is certain only when the following conditions are noted in their proper chronological order: A, indurated chancre with indolent inguinal buboes; some weeks later, a typical roseola or other syphilitic eruption, cephalalgia, alopecia, or mucous patches; a complete absence of tertiary accidents for some years; finally a new indurated chancre after a suspicious coitus, with characteristic glandular enlargements, followed, after some weeks, by undoubted secondary symptoms, such as those above mentioned, In these cases the difficulty lies in the fact that it is at times practically impossible to distinguish the primary lesion from the indurated pseudo-chancre. Such chancres may be divided into: First, those which develop, as the result of a spontaneous awakening of the syphilitic virus, at the point where the latter has already been active. In this case it is sometimes impossible, where one has observed the lesion at its commencement, to distinguish it from syphilitic chancre; for, according to the investigations of fournier and others, it begins by a hardness profound from the first, then becomes excoriated and forms a sore, while the induration of the true chancre is consecutive to the ulceration, or, at most, coincident with it. Second, those which occur as the result of an extrasyphilitic irritation; the inoculation of the chancroidal virus, for example, or an outbreak of simple herpes, or the lesion of some

form of traumatism. In this case the sore has preceded the induration. Objectively, these lesions may be absolutely identical with the indurated chancre. Their ulceration is somewhat deeper, but more excavated and attended with more secretion; these characteristics may, however, be absent. There is no incontestable example of a case of reinfection in a syphilitic who is suffering from secondary manifestations of the disease. Reinoculation practised upon persons presenting the tertiary forms of the eruption has invariably proved unsuccessful. For the reason that the affection is most often contracted during sexual intercourse, the chancre is most frequently observed upon the genital organs. In the male it occurs upon the glans penis, in the coronary sulcus near the fraenum, upon the inner or outer surface of the prepuce, on the skin of the penis or scrotum, and at the urinary meatus or deep within the urethra. In the female the parts oftenest attacked are the labia majora and minora, the fourchette, the preputial covering of the clitoris, the entrance to the vagina, the os uteri, the perineum, and the inner surface of the thigh at the upper part. Elsewhere on the body the primary lesion may be encountered on the lips, the tip of the tongue, the tonsils and walls of the pharynx, the nipples and breasts in nursing women, the base of the nail and finger tips in physicians, midwives, etc., the lobe of the ear, the parts about the eye, and the umbilicus. In short, any part of the body where a solution of structural continuity may occur, and to which the syphilitic virus can be carried, may become the seat of a chancre. Chancres of genital location are termed in either sex genital chancres, and all others extragenital chancres. There are constant and characteristic features which all chancres have in common, namely, the period of incubation above described, the peculiar thickening and hardening in or about the lesion known as induration, and the enlargement of the lymphatic glands in the near neighbourhood. The induration, in its degree and extent, differs very much in different chancres according to their anatomical location, and the amount of external irritation to which they are subjected. The thickening may involve only the base of the lesion, seeming to the touch like a piece of parchment set within the tissues, or it may produce a mass the size of marble and varying in density from that of cartilage to bone. The induration can frequently be detected at the outset, or, if inappreciable then, will usually make itself apparent within a few days. It continues to increase for a period varying from ten to fifteen or more days. At times the occurrence of induration is deferred somewhat longer, but it never fails to show itself. If the thickening be slight, it may disappear entirely before the chancre heals, but if extreme it usually disappears slowly. Some trace of it can usually be discovered at the time of the first mascular eruption unless this be much delayed. In a few cases it lasts for as long as six or eight months. Syphilitic bubo is the term applied to the glandular enlargement which accompanies the chancre. When the chancre is situated upon the penis, the bubo exists in

both groins. It is said at times to be unilateral, when the chancre is not situated in the median line. This statement, however, needs confirmation. Enlargement on one side only is of doubtful character. The glands are but slightly or not at all painful, and freely movable beneath the skin. They usually form in a series decreasing in size from the one nearest the chancre. In size they vary from that of a tangerine orange to that of a hazelnut. The skin is not inflamed as in chancroid, and they rarely suppurate. Double inguinal adenopathy, with a characteristically indurated chancre appearing at the end of an incubative period of not less than three weeks, is pathognomonic. The duration and character of the bubo is markedly influenced by treatment. Chancres may be of various forms. They are frequently developed upon the site of preexisting lesions, such as herpetic vesicles, smokers' patches, fissures, and excoriations, and take on certain of the features presented by such lesions. Anatomical location, pressure effects, friction, and treatment all tend to modify the chancre and in various ways determine the form it shall take. No one lesion can be taken as a type of all chancres. Each must be studied by itself. Erosion is the simplest type and the one most frequently encountered. It appears as if a limited area of the epidermic or mucous membrane had been rubbed or scraped away. This form is frequently spoken of as the "chancrous erosion." It is the primary form of the initial lesion, but with its simplicity it is the form that presents the greatest difficulty in recognition. At the commencement it is much larger than the surface of a pinhead, is rounded or oval in outline, and appears as if the epithelium had been removed by friction with the clothing or opposing parts of the body. The eroded surface is on a level with the surrounding skin, or but little depressed below it. Examination of the base usually shows a slight degree of induration, as if the lesion were resting on a piece of mica set in the skin. This may be wanting if the chancre is seen early, but it makes its appearance within a short time. During the evolution of the chancre the induration becomes well marked. The eroded surface remains diminutive in size, or enlarges by peripheral extension until it becomes as large as or larger than a sixpence. The lesion is dark-red or grayish in colour. The surface has a glazed, velvety appearance, and at times is covered with a closely adherent pellicle looking somewhat like a diphtheritic membrane. The base is bathed in a sticky serous exudate. The latter can be made to flow freely by making gentle pressure at the sides, or the lesion may bleed on manipulation. This form of chancre is usually single, but may occur in numbers of a dozen or more. The minute eroded surfaces in such instances are grouped together, but each lesion is separate and distinct. The resemblance of such chancres to the lesions remaining after the rupture of a number of herpetic vesicles has given rise to the designation "multiple herpetiform chancres." Early in their course they are exceedingly difficult to distinguish

from progenital herpes; but the absence of itching and burning sensations should prove useful in this respect. The chancrous erosion, when single, sometimes assumes a cup-shaped depression with slightly elevated borders, or the floor may be lifted by the indurated base until it appears like an excoriated papule. This form of chancre is frequently found in the male on the under part of the prepuce, or in the coronary sulcus. It finds the conditions best suited to its expression in those situations where it is protected from friction or exposure to the air. The induration may increase to such an extent that it gives to the chancre the form of a nodule varying in size from a pea to a marble, and as hard as ivory. The erosion, often no larger than a pinhead and retaining its distinctive features, can usually be found upon the surface of this enlarged and hardened mass, or the chancre may heal and disappear while the nodule continues to increase in size. Nodular lesions of this kind are most frequently met with in the furrow behind the corona glandis, its development here being favoured by the abundance of connective tissue. The dry papule is a variety of chancre which occurs in situations not subject to heat or moisture. The skin of the penis, the surface of the glans in men who have been circumcised, the public regions, and the skin of the body in general furnish favourable sites for its appearance. The papule begins as a reddened, indurated point not much larger than a pinhead, and increases slowly in size and elevation until it is several lines in length. The lesion is firmly indurated throughout, and the tissues at the base are more or less involved. The summit of the papule is flat or convex, and is usually covered with a dry, somewhat adherent grayish scale. The papule is often surrounded by a reddened areola. Its hue is dusky-red or ham-like. It may continue as a papule throughout its entire course, or be converted into a pustule, and later degenerate into an ulcer. A deeply pigmented spot not infrequently remains after resolution. The pustular or ecthymiform chancre generally develops from the dry papule. This type never originates primarily as a pustule, but is always secondary to some other form, and is due to infection of such lesion with pyogenic microorganisms. There is always a considerable degree of inflammation in and about the chancre, owing to the nature of its pus-producing elements. The roof wall soon breaks down, and the pustule becomes surrounded by a friable, yellowish or greenish-yellow crust. When the lesion is located upon the surface of the prepuce or upon the glans, considerable swelling of the former is apt to occur. It is no uncommon thing to observe the development of chancres in the form of ulcers. In all cases such ulceration is caused by friction, irritating discharges, uncleanliness, infection with pyogenic germs, or improper treatment. A chancrous erosion is not infrequently converted into a lesion of this type by the early and severe use of caustics. The ulcer may be either superficial or deep. When superficial the ulcer resembles the eroded form of chancre in its early stages, in that the base is not often deeply indurated. The ulcer is shallow, has

sloping walls, a raised, or but slightly elevated, border, and an unhealthy granular pus-secreting floor. In deep ulcers the ulceration extends profoundly into the tissues, and the induration seen at the base and borders of the chancre exceeds that seen in any other form. This form of chancre is known as the "Hunterian chancre." The walls are never perpendicular, but always slope gradually to the floor of the ulcer. The edges are raised, thickened, and intensely hardened. The secretion is purulent, and may be scanty or profuse. At times the lesion may be haemorrhagic and blood be mixed with the pus. The base of the penis overlapped by the pubiic hairs, or the junction of the scrotum with the thighs, is a favourite site for its development. Swelling and oedema of the penis not infrequently and coincidently occur. Loss of tissue and the formation of a well-marked cicatrix accompany resolution. With the exception perhaps of a pigmented spot, chancres usually undergo complete resolution, leaving no trace of their former existence behind. When persisting until the development of skin eruptions, they are frequently converted into lesions of a distinctly different type; the names "moist papule" and "mucous patch" have to these been applied. Mixed chancres are those which arise from simultaneous infection with the spirochaete pallida and the chancroid bacillus, the chancroidal elements being the first to develop. The sore appears without incubation shortly after exposure to infection. A pustule is the first thing observed. It is markedly inflammatory in its nature, and shortly becomes ulcerative. No induration can be discovered at its base. If the sore appears upon the penis, a single gland in one groin may enlarge. Rarely do we find enlargement in both inguinal regions. The gland is tender to the touch, and soon becomes extremely painful. There is reddening of the overlying skin, and suppuration may be observed. The sore takes on new features after the period of syphilitic incubation has passed. The base becomes hardened and the chancre assumes the characteristics of the ulcerative initial lesion of syphilis. In a short time there follows multiple instead of single glandular enlargement, and constitutional syphilitic manifestations are seen in usual course.

SECONDARY LESIONS.

CUTANEOUS SYPHILIDES.

There are a number of ways, all well-defined and characteristic, in which syphilis may manifest itself on the skin - on which structure it is usual that the first positive proofs of systemic invasion of the malady are to be found; and throughout the entire course of the affection the skin may show, in some part of its extent, evidences of the ailment. The lesions presented very much in their nature, character, form, distribution, extent, and gravity of deportment. Those occurring early in the course of the disease are usually benign in nature and extensive in distribution, while those occurring at late periods are apt to be localised and destructive in their tendencies. Macules are the earliest of the syphilides to make their appearance. They begin

as slightly muddy discolorations of the skin, giving to the surface of the body a particularly mottled appearance. Often this condition cannot be seen with light reflected from the surface of the skin, but only when the light comes to the eye in an oblique direction. The eruption may come out slowly, ten or more days being occupied in the process, or it may develop rapidly, a single night sufficing for its complete evolution. This latter is more apt to be the case if the system has become overheated and the cutaneous vessels relaxed as by a recent hot bath. The eruption in its complete expression consists of isolated macules, roundish or irregular in outline, from the surface of a split-pea to a threepenny-bit in size, and of a pinkish or brownish hue. The colour fades at firat on pressure, but later becomes more or less persistent. The eruption usually makes its appearance at firat upon the surface of the abdomen or of the chest; but it may occur in other locations, as the dorso-lumbar region or over the scapulae and shoulders. The process, if severe, may extend over the greater part of the surface of the body. The face usually escapes, but when affected the process is seen in its best development at the base of the hair and over the forehead. The eruption occurs almost constantly upon the palms of the hands and the soles of the feet. Examination of these regions should always be made in case of suspected syphilis. The spots here show themselves as faint or well-marked erythymatous patches, circumscribed or ill-defined in outline, and fading on pressure. They may persist in this form throughout their entire course, or later develop into acaling papules. The backs of the hands and feet are not so often affected in this way. Early in the course of their evolution the macules are usually unmixed with other forms of syphilitic lesions, but they may be readily transformed, or subjected to any form of irritation, into maculo-papules, in which there is slight elevation of the surface, and these be converted later into distinct papules. Occasionally they are commingled with pustules, There is generally some accompanying involvment of the mucous surfaces. Inspection of the throat shows hyperaemia of the pharynx, of the pillars of the fauces, and of the soft palate. The gums may also be in a spongy condition. Usually resolution is complete, no traces being left after healing, except perhaps in severe cases some temporary pigmentation. Papules are amongst the most common and most characteristic of syphilitic eruptions. They may appear at any time after the third month of the disease. Any part of the body surface may be affected. Frequently they appear in crops, and recurrence often takes place. They are discrete or in groups. Careful examination shows the groups formed in curved lines, circles or parts of circles, and S-shaped figures. Such grouping is pathognomonic, and is best seen over the abdomen and chest or upon the integument of the back. The papules vary in size from a grape-seed to a split-pea, or even larger. The large and small varieties may be commingled in the same subject or be separate and distinct, a given person showing but one form throughout the course of his disease.

It is seldom that these small papules are converted into the larger varieties. Occasionally they become pustules. They are many or few, conical or flat, moist or dry, and vary in colour from a light-red to a dark-ham tint. Complete resolution generally occurs. Dry papules occur in two forms - the military and the lenticular, the former have been seen less frequently than the latter. They occur oftenest in uncleanly and neglected cases. For this reason they are observed more frequently in public than in private practice. Women exhibit them oftener then men. The papules are about the size of a pinhead, and when seen in their completest expression are thickly distributed over the entire surface of the body. They are conical in form, and the summit may be capped by a minute scale or be the seatof a tiny vesicle. Involvment of the hair follicle frequently occurs, and the papule is then pierced by the hair filament. Limitation of the military papules to exposed surfaces, such as the face and hands, sometimes takes place, while the parts of the body protected by the clothing are the seat of much larger varieties. In cachectic and anaemic patients the appearance of a crop of military papules is often the precursor of an extensive pustular syphilide about to develop. Lenticular papules are the commonest of the early syphilides. They are liable to occur at any time during the first two years after infection, and may appear at a still later period. They vary in size from a large pinhead to a coffee-bean, have a flattened or rounded surface, are seldom much elevated, and are frequently surrounded by a fringe of scales known as the "corona veneris." The base of the papule is usually quite firmly indurated. The summit is smooth and glistening or capped with a thin and firmly adherent scale. Often the papules are so slightly elevated as to be distinguishable from macular lesions only by the sense of touch. Such lesions are known as maculo-papules, or the summit may be converted into a pustule without the base undergoing any change, the lesion being then called a papulo-pustule. Scaling papules are not infrequently encountered in syphilis which none but the expert can perhaps distinguish from the lesions of psoriasis. The scales here lack the lustrous appearance presented in psoriasis and are not so freely shed. On the contrary, they are frequently so firmly attached to the surface as to requiresome force on removal, and when the scale is lifted away there are no minute bleeding points found beneath as in the psoriatic lesion. Other lesions of an undoubted syphilitic character can usually be found in the immediate vicinity or elsewhere upon the surface of the body. Not infrequently papules appear in the palms and on the soles, and in such localities present features somewhat different from any shown in other parts. This is owing to the density of the epidermal coverings in the regions named. Instead of involving the epidermal layers throughout, as is usually the case, they here appear to be buried beneath the epidermis or confimed at least to its lower strata. Later they make their way to the surface and become true scaling

papules, not at all or only slightly elevated. The epidermis covering the centre of the lesion is first cast off, thus giving to its summit a pitlike depression. The edge of this depression is surrounded by a fringe of torn and dirty-looking epithelium. The centres of the palms and soles are the parts usually first to be affected. Later on the papules, by peripheral extension and coalescence, may form scaling patches covering surfaces as large as, or larger than, a crown-piece, or they may remain as distinct and discrete papules, while thickly studding the surface. They may extend to the fingers; though the eruption is usually symmetrical, the right hand is the one most apt to be severely affected. Moist papules are those which present a moist or secreting surface; they are found on the skin in situations favouring such development. Warmth and moisture are necessary conditions, and such factors are to be found in the axillae, between the nates, in the perineal region, between the scrotum and thigh, within the lips of the vulva, and underneath the overhanging breasts of fleshy women. Here the papules begin as in the dry form, but are quickly converted into lesions little or not at all elevated, and having a circumscribed eroded surface secreting a sticky, mucilaginous fluid. Sometimes they are covered by a grayish pellicle with a resemblance to a diphtheritic membrane. The lesions, when plentifully and fully developed, give forth an almost unbearable odour. This form of moist papule differs in no respect from mucous patches seen within the oral cavity. Its structure, development, and complete evolution are the same as in the mucous patch, and it is frequently called by the same name. About the mucous outlets of the body a different kind of moist papule is apt to form. This variety is characterised by hyperplasia of the cell elements, with consequent elevation of the resulting lesion. Papules of this kind are called condylomata, and occur in either a flat or a pointed form. The flat condylomata are seen as eminences varying in size from a threepenny piece to a crown, and have a whitish or grayish-white, macerated surface bathed in a tenacious, mucoid fluid or covered with an adherent grayish pellicle. The secretion is extremely offensive in odour and in the highest degree infectious. Often the irritating effects of the secretion beget a similar lesion upon the apposed surface when the condyloma is between the buttocks, so that two lesions of like nature are brought face to face. This form of condylomata may be single or multiple. Pointed condylomata, or "venereal warts," seen so often in syphilitic subjects, differ from the preceding form, not only in their character and appearance, but in the fact that they are not strictly syphilitic lesions. They are produced at any time when the parts are subjected to undue and long-continued irritation, such as happens when pathological discharges like those of gonorrhoea and leucorrhoea flow over the vulva, over the perineum, and over the anus, or, in the male, are imprisoned between the prepuce. Secretions from certain syphilitic lesions, such as moist papules and flat condylomata, give rise to them as well. Hence it

happens that they are found in accompanying true lesions of syphilis as an accident only of the process. In determining the presence or absence of syphilis it is therefore important that too much significance should not be attached to this form of condylomata. Examination may reveal the presence of one or more of these pointed papules. They are filiform or conical in shape, with a broad or narrow base and a tufted apex. When multiple they frequently form masses as large as a hen's egg. Inspection of such mass always shows it to be made up of a great number of distinct and individual wart-like structures. The lesions may be dry, but are usually covered with moisture. This may be a true secretion on the part of the wart, or be perspiration arising from the warmth of the part. The lesions are apt to bleed readily and freely upon the slightest irritation or surgical interference. The coronary sulcus in the male and the inner surface of the labia majora and minora in the female are the most common situations for their presence. Pustules are often encountered in this disease, most frequently, however, in the ill-fed, unclean, debilitated subjects seen in hospital, dispensary and workhouse practice. This fact strongly suggests their being an accident rather than a definite symptom of syphilis, and such belief is gaining ground amongst present-day authorities. Pustules are usually developed from papules. They seldom appear as elementary lesions. The summit of the papule is first converted into a minute vesicle. As this enlarges its contents become turbid, and then pustular. The pustule may be confined to the apex of the papule, occupying only that space first shown in the vesicle, or the entire papule may become involved in the process. Pustules also appear on any part of the body. In the early stages of the disease they are apt to become symmetrical and extensive in their distribution. Later they develop in groups having a circinate arrangement. Early in the course of the disease they are small, and more abundantly developed than when occurring in later periods. When first appearing they are discrete, but later may become confluent and give rise to superficial or deep ulcers. The lesions may be clustered in circinate groups or be distributed freely without definite arrangement. Frequently they involve the hair follicle, especially on the face and scalp. A dull ham-red areola is often distinguishable at the base of the pustule or of the papule on which the pustule rests. When ulceration does follow, the pustules disappear, and exfoliation of the epidermal coverings takes place. If the pustules be large and deep, well-marked cicatrices are left after healing. Not infrequently pigmentation occurs, and a dark coppery tint is given the affected part. The cause of the ulcer formation is the coalescence of a number of pustules, or enlargement of the individual lesions. They are apt to occur late in the disease and in cachectic and anaemic subjects. Only the superficial layers of the epidermis may be involved in the process, or the ulcer may burrow deeply into the skin and subcutaneous tissue. Superficial

ulcers are usually small, not often increasing much beyond a threepenny-bit in size. The base is indurated, and a light and friable or greenish-yellow or dirty crust covers the ulcer. At different parts of the body, in the later stages of the disease or early when it is pursuing a severe course, large pustules, in groups of six or more, may make their appearance. These pustules unite and form what is known as "pustulo-ulcerative syphiloderm." This ulcer is deeply seated, frequently painful, and secretes pus in abundance. It is capped by a large greenish or brownish crust, underneath which a well of blood and pus can always be found. The pus dries rapidly, and the resulting crust is more or less firmly adherent to the edge of the ulcer. When the crust is removed and the ulcer cleaned of its contents, the ulcer shows a punched-out appearance. The sides are precipitous, and the base is uneven and granular. Such ulcers leave a deforming scar, which is usually recognised as syphilitic without much difficulty. The term rupia has been invented to designate ulcers occurring in syphilis in which the crusts assume a conical or oyster-shell shape. The crust is made up of a number of layers, the one at the bottom covering the greatest extent, and each succeeding layer becoming smaller as the summit is approached. The crusts may reach an inch or more in height and cover an area as large as a crown. They are produced by successive additions to the crust from beneath, while the ulcer enlarges peripherally. The layer at the top represents the first one formed. The ulcer may be superficial or deep. Rupia occurs only in uncleanly, neglected cases, and it generally means that the syphilitic attack is severe. In the course of the affection one often observes the formation of tubercles. They may appear at any period of the disease after the expiration of the first three months, but are seen more frequently in late than in the early stages of the malady. They occur most often in those cases in which early treatment has been improperly conducted or entirely neglected, and differ but little from gummata in their general characteristics. They are apt, however, to occur at a somewhat earlier stage and run a milder and more tractable course. They also appear in greater number and involve the skin less deeply. The possibility of confusing them with gummata must be borne in mind. They may be seen on any part of the body, but most usually make their appearance upon the face and limbs. The point of the chin, the alae of the nose, and the skin covering the knee and elbow joints are favourite sites for their development. They may occur singly, but usually are seen in groups of six or more. They appear as small nodules about the size of a pea or a bean, set well within the tissues of the skin, and present externally a globoid surface. They are firm to the touch, and in colour they vary from a dark-red to a coppery hue, the tint assumed varying with any change in the blood-supply of the part, such as is apt to occur after violent exertion; there is then a decided deepening of the previous stain. The circular form of

grouping, distinctive of syphilitic lesions, is here frequently encountered. Often extension of the process is by the formation of new rings about, or in conjunction with, similarly formed groups, with consequent figure-of-8 and other peculiar formations. Tubercles exhibit considerable variations in course and resolution. Often the lesion undergoes degeneration, and absorption of its products takes place without destruction of the overlying integument. This happens frequently upon the face. In such cases there is the formation of a true scar without the breaking down and removal of the epidermal layers. The scar is depressed and not infrequently pigmented. In time the pigmentation usually disappears. It may happen that resolution takes place thus in one part of the group, while the lesions in another part are still in the course of their formation. A common method of its removal is the degeneration and destruction of the tubercle by ulceration. Softening of the apex occurs, the roof-wall breaks down, and the degeneration products of the lesion are discharged. The ulceration goes on to complete removal of the tubercle, and may extend much more deeply into the tissues. In this latter case the deep extension of the ulcerative process is undoubtedly due to gummatous infiltration of the tissues about and below the tubercle proper. After destruction of the tubercle is complete, repair ensues by the formation of a cicatrix. Frequently, where the process is unrecognised and unchecked, the lesions continue to develop in circles, or parts of circles, about the sites of existing tubercles, each new crop enlarging the area affected. In this way patches may be formed covering the greater part of the forearm, the thigh, or one or both buttocks. At the border of the area is a line of advancing tubercles, many of them in a state of ulceration, while within, the process is represented only by the lesion relics of the affection in the form of cicatricial tissue.

TERTIARY LESIONS.

GUMMATA.

Gummata are a late manifestation of the effects of syphilis, and are generally to be found in the external integument of the body; but it is as well to bear in mind that they may be seen within the first six months after infection in malignant cases or where the disease is pursuing a rapid and destructive course. They are firm nodules deeply set within the skin or subcutaneous tissue. At first they are freely movable over the deeper structures and within the skin itself, but later they become attached to the underlying periosteum, bones, cartilage, or muscles. The skin becomes reddened and inflamed, finally breaking down and permitting the discharge of the gummy mass. Gummata vary in size from a pea to an orange. They are spherical or globoid in shape, or may be flattened or irregular in outline. In their earlier stages they are sensitive in a slight degree only, but later they become extremely tender and painful. They are usually single or but few in number. Rarely do they occur in great numbers, as hundreds in one patient. Any part of the body surface may be the

seat of gummata; but they are seen with greatest frequency upon the lower limbs and the skin of the forehead and scalp. Their frequent development upon the limbs is probably due to the natural gravitation of the blood thereto. No matter where they occur, they tend to produce ulceration and destruction of the part. This may occur in the skin with startling rapidity, a few days only sufficing for complete softening and removal of the tissues affected; or the lesion may persist for weeks and months, with no signs of change occurring in its substance save that of gradual enlargement. Very often the gumma extends deeply into the tissues, involving muscles, bone, and cartilage in its destructive course. When this occurs upon the face, frightful deformities are likely to result. Thus the cartilages of the nose and the bones may be attacked and entirely destroyed, or the lobe of the ear may be in part or wholly removed, the appearance produced being akin to that characteristic of the ravages of some malignant disease. Gummatous ulcers are of an indolent and sluggish sort. Their size is determined by the lesion from which they arise. They are circular, oval, or irregular in outline. The edges may be thickened or undermined, the sides precipitous, and the floor uneven, foul, and dirty with brown or greenish-coloured pus. In cachectic and poorly nourished individuals such ulcers may become the seat of gangrene. When the necrotic mass is entirely eliminated, the ulcerative process ends and repair begins. Healthy granulations cover the floor and sides of the ulcer, the thickened edge is smoothed out, and the process is completed by the formation of a scar. This cicatrix is circular in outline, smooth, white in the centre and pigmented at the border. The scar is deep and firm, usually being attached to the part underneath. For the establishment of antecedent syphilis it is necessary that one be thoroughly familiar with the appearances presented. In certain cases a diffuse gummatous infiltration of the skin or subcutaneous tissue occurs, particularly over the back or upon the lower limbs, as the parts of the leg between the knee and ankle. Reddening, swelling, tumefaction, and soddenness of the skin are observed. Nodules appear at various points, break down quickly, and discharge their characteristic gummy material. If unrecognised, the process may continue for a long time, resulting in great thickening of the skin and the production of abundant cicatricial tissue, or the entire gummatous area may break down, forming a single gigantic ulcer; upon the belly the latter is apt to be of a serpiginous character; in this locality, however, gummatous infiltration is rare. Occurring in the genitals, such infiltration may give rise to contraction of the penis or stenosis of the vaginal orifice.

REGIONAL SYPHILITIC LOCATIONS.

SEXUAL SYSTEM.

A chancre is of very common occurrence in the PENIS, and has the characteristics already described. Oedema and diffuse swelling of the organ are complications likely to occur, especially if the lesions be large and

subject in any way to irritation. Phimosis or paraphimosis may also be observed as complications. The organ is then swollen, and a tenderness and heat will always be observed. The lymphatics become inflated and painful, and seem to the touch like whipcords running along the dorsum of the organ and encircling its root. The condition is temporary and resolves under specific treatment in usual course. The chancre interfering as it does with the return circulation, the glans penis sometimes assumes a blue colour suggestive of gangrene, this being apt to occur with large and deeply indurated chancres situated in the coronary sulous. It disappears with the healing of the chancre. The irritating discharges from the latter may give rise to balanitis and posthitis. Scaling papules may be found on the glans penis when no other lesions indicative of syphilis can be discovered. A slight catarrhal discharge from the urethra is sometimes seen early in the course of the disease. This is probably due to mucous patches within the urethra. Gummata, appearing as firm and spherical nodules, may be found within the corpora cavernosa, giving a crooked appearance to the organ when erect and later producing a swelling of the part. The tendency of such neoplasms is towards degeneration, with absorption of the products and subsequent development of circumscribed areas of fibrous connective tissue. Permanent deformity of the organ then results. Obstinate urethral strictures may be the consequence of the rare occurrence of gummata in the corpus spongiosum. Finrotic areas within the cavernous bodies may occasion a band-like circle around the organ interfering with its erectile power.

The TESTICLES not infrequently become syphilitic, either early or late in the disease. The epididymis swells and enlarges, and condition of syphilitic epididymitis is produced, which differs from the gonorrhoeal form in certain well-recognised particulars. This early syphilitic epididymitis later in the course of the disease presents a circumscribed area of inflammation of a more intense character, and may be observed in one or both organs. Circumscribed gummata or diffuse areas of gummatous infiltration occur late in the disease, and are of slow growth. The gummatous infiltration may involve the entire epididymis, or be confined to a portion of the organ only. Extension of the process to the testicle proper and the spermatic cord not infrequently is found, and irreparable injury to the organ occurs in neglected cases, though the condition is amenable enough to proper treatment. The testicle proper is usually involved late in the disease and from the formation of gummata. These may appear first in the substance of the organ, or they may begin in the tunica vaginalis investing the organ, and from this extend to the deeper structures. In the tunic they form small, round, freely movable nodules; but deep-seated ones may not be palpable until they have grown to a considerable size. They may be single or multiple. The testicle may be invaded throughout its entire substance by the gummatous deposit, or the process be limited to a portion only of the organ. The enlarge-

ment takes some time to occur. The substance of the gumma is dense and as hard as ivory, The testicle may be sometimes as large as a child's head, and the surface of the organ is smooth, in contradistinction to the orchitis of tuberculosis which is characterised by unevenness and roughness. Occasionally there is effusion of liquid into the tunica vaginalis with the formation of hydrocele. One or both testicles may be affected. The process is very tardy and sometimes of years' duration. The end of the malady is absorption of the gummy exudate and the development of fibrous tissue, leaving a shrunken, withered organ; or softening of the gumma may result in complete destruction of the testicle, though this is unusual as is the formation also of fungous growths.

In the case of females chancres are very commonly observed; but being more or less invisible are not so easily recognised. The os uteri and orifice of the vagina are the favourite sites of the lesion. Chancres are seldom seen upon the vaginal walls. They may occur in the urethra. The early lesions of constitutional syphilis may be found upon the vulvar orifice and within the vaginal canal, most frequently as condylomata or mucous patches. The characteristics of condylomata have already been sufficiently described. Mucous patches occurring upon the vaginal walls differ but little from those seen in the oral cavity. They are accompanied by leucorrhoeal discharge, which contributes to the severity of the condition. They are eminently infectious. Syphilitic affections of the rectum may involve the posterior wall of the vagina. The remainder of the tract is not often the site of gummata. Little is known regarding the early syphilitic affections of the uterus and ovaries. In both gummata may develop in the later stages. In the ovary the changes taking place resemble those occurring in the testicle. The gummatous deposit may be diffuse or circumscribed; and wasting and shrinking of the organ are by no means infrequent relics of the syphilitic attack.

URINARY ORGANS.

It is only comparatively seldom that the BLADDER shows signs of syphilitic involvement; and we know very little regarding the manifestations of the disease in its early stages. Merely a temporary hyperaemia has been observed. In the later stages gummata, papillomata, and hypertrophic growths have been found. Extension of ulceration from adjacent organs may lead to the development of fistulous tracts.

Syphilitic affections of the KIDNEY may be found at any stage of the constitutional disease. Examination of the organ in the early stages shows well-marked organic changes in the renal substance. The kidney is much enlarged, and appears gray or grayish on section. The cortical portion is thickened, the epithelium in the convoluted tubules swollen, and the tubes in places filled with broken-down tissue and catarrhal products. The term "large white kidney" has been applied to this condition. Late structural renal alterations are more severe and disastrous in their results than are the

earlier lesions. The process here is usually complex in character and referable to several distinct and separate conditions. Principal amongst these are the formation of gummata, amyloid degeneration, and inflammation of the interstitial connective tissue. These processes operate in conjunction in various degrees, though rarely one may exist singly. Usually both kidneys are involved. Gummata are found post-mortem often in syphilitics in whom during life no definite renal symptoms have been observed; their presence should therefore always be examined for. The process is usually localised in chromic interstitial nephritis due to syphilis. The areas of implication are contracted, giving to the surface of the organ, when seen in post-mortem examination, an irregular, uneven appearance. They may be few or numerous, and vary in size from that of a pinhead to a hazelnut.

LIVER.

The fact that the liver frequently becomes syphilitic is well known, the affection manifesting itself either in the production of gummata or in the development of fibrous connective tissue. Gummata are usually of late development. They occur in small or large numbers, and in any part of the organ. In the earlier stages they are small, firm nodules composed largely of connective tissue. Spindle and small round cells are scattered throughout their substance. The connective tissue sends radiate processes into the surrounding parenchyma. When the lesion is situated over the capsule or near it, the surface of the organ is apt to show a depression due to the contraction occurring in the connective tissue elements of the underlying gumma. Gummata here show various forms of degeneration. Softening and ulceration occur, but are infrequent. Caseous degeneration with absorption of the product and the development of fibrous connective tissue are more usual. Calcification may occur. Contraction of the areas affected often takes place in such a way as to produce appearances resembling new lobes. At first the liver is enlarged, oftentimes so as to be noticeable during life on palpation and percussion. Later, owing to the contraction of the resolving gumma, it becomes much reduced in size. It is in the neighbourhood of the suspensory ligament that the development of gummatous tissue is most frequently observed. Development of fibrous tissues in the organ occurs without accompanying gummatous change. In such case the fibroid tissue appears to arise in the capsule of the liver in broad or narrow bands. The septa thus formed are again intersected by like bands arising in the larger bundles. In this way the organ is divided into a number of separate and distinct lobules. The process is chronic and there usually occurs atrophy of the affected portions.

CIRCULATORY SYSTEM.

The circulatory system is involved early in the course of the syphilitic attack. Thus, in the chancre, before marked invasion of the system by the specific poison has taken place, constant and characteristic changes are observable in the vessels entering and leaving the part,

and throughout the course of the malady the blood-vessels are apt to display marked lesions. The abundance of connective tissue in the arteries and veins is doubtless responsible for this.

HEART.

This organ shows signs of syphilitic implication less often than the blood-vessels; but when it suffers it does so severely and dangerously and commonly terminates the life of the patient. Gummata and fibrous myocarditis are the best-known lesions. Gummata may be seen in any part of the organ, but most usually in the endocardium, along the edges of the valves, and in the interventricular septum. The tumours vary in size from a pinhead to a hazelnut, and appear as circumscribed, spherical, non-vascular, yellowish or whitish bodies set somewhat deeply in the tissues affected. They show on section a necrotic, cheesy centre surrounded by a connective tissue capsule. From this capsule strands of fibrous tissue can be seen radiating into the surrounding parts. No trace of muscular elements remain at the site of the nodule. They appear to have undergone fatty degeneration with complete absorption. When this occurs, shortening, thickening, and weakening of these structures take place. Death produced by their rupture has been known to occur. In stillborn infants affected with congenital syphilis in the heart has been found thickly studded with tiny gummatous formations. Syphilitic fibrous myocarditis occurs in consequence of an arteriosclerosis or obliterating endarteritis of the coronary arteries. The part of the heart supplied with blood by the branches of the particular artery affected becomes impoverished, undergoes degeneration, and its structures are replaced by fibrous tissue. Any part of the heart may be affected. Frequent sites of its occurrence are the papillary muscles and the septum. These parts are thickened, become sense and firm, and are found on section to be composed almost entirely of fibrous connective tissue with only a meagre vascular supply. Occasionally spindle cells are found mingled with the fibrous elements. Gummata frequently exist in intimate association with this form of affection. The endocardium in some cases undergoes a like fibrous change. It is then greatly thickened, becomes gray or grayish-white in colour, and takes on somewhat the consistency of cartilage. This rigidity during life interferes with the free and normal action of the organ. Post-mortem examination sometimes reveals the presence of aneurysm of the heart's ventricular walls. This is due to softening and excavation in a gumma opening into the ventricular cavity, or is the result of the dilatation of an area of fibrous myocarditis. The cavities of such aneurysms are not infrequently filled with thrombi, and their walls are composed of dense fibrous tissue.

BLOOD-VESSELS.

Autopsies made on syphilitics in both the early and the late stages of syphilis will reveal the fact that the blood-vessels do not escape. The arteries are mainly affected, and in not a few cases the veins show no signs of disease. Fatty degeneration and gummatous

changes have been observed in the capillaries, but beyond these affections little is known regarding the behaviour of the arterioles in this disease. Obliterating endarteritis, gummata, arteriosclerosis, and aneurysm are the most common affections of the arteries in syphilis. The commonest and most serious of all is obliterating endarteritis, which mainly affects the smaller vessels. There is partial or complete closure of the lumen of the vessel due to proliferation of the endothelial elements in the intima. The spirochaete pallida or its toxins circulating the blood excites the proliferation by means of its irritative action. Thickening of the intima takes place, layer after layer of the endothelial cells forming one within the other until the vessel is nearly or entirely closed. The adventitia is attacked, and generally all coats of the vessel become affected. A true inflammation may be excited, with subsequent production of granulation tissue. This latter is converted into fibrous connective tissue having a marked tendency to contract. If the lumen of the vessel is still partly patent, the contractility of this newly formed tissue is usually sufficient to close it. The nutrient vessels are made to share in the process and are completely obliterated. The process is usually confined to limited and localised areas. The arteries at the base of the brain and coronary arteries suffer most frequently. There may, however, be implication of any of the body arteries. The larger arteries are the ones which show gummata; these are localised or diffuse. The adventitia suffers more often in the circumscribed form than do the other coats. The lumen of the vessel is partly closed by pressure of the mass inwards. The narrowing is still further accomplished by thickening of the intima. Thrombi frequently form at the narrowed point. The gumma undergoes its peculiar change, softens, discharges its contents into the circulating blood, and then becomes the seat of an aneurysm. In the diffuse form of the gummatous infiltration occurs between certain of the vessel's coats, such as the intima and adventitia. The entire circumference of the vessel wall may be involved, or only a part be affected, while the process may extend along the artery for some distance. Fatty or cheesy degeneration of the gummy infiltrate takes place, and later calcification, leading to the production of atheroma. The carotids and arteries of the brain appear to suffer most frequently. Apoplectic seizures may be the result of sudden rupture of the weakened walls of the vessels under strain. Arteriosclerosis is often a result of syphilis. It is seen most often in robust individuals between thirty and fifty years of age who have suffered from the disease in early life. The affection is apt to be generalised. The lumen of the vessels is enlarged, instead of being narrowed as in endarteritis. The intima is thickened and often becomes the site of atheromatous change. The walls throughout are hard and inelastic. To the touch they feel like whipcords beneath the skin. The condition is in no wise distinguishable from the same disease when it is caused by alcoholic or lead poisoning or gout.

LUNGS.

These organs are seldom implicated in the manifestations of the acquired disease; when attacked it is always at a late stage. The changes found in post-mortem examination are due to chronic interstitial inflammation or to a gummatous deposit, either circumscribed or diffuse. The two forms may be distinct or associated. Gummata are found in the lungs as tumours varying in size from a pea to a hen's egg, and may appear singly or distributed throughout the pulmonary tissue. The root of the lung is a favourable site for their development. The tumours are grayish or yellowish-white in colour. In their earlier stages they are firm, indurated, circumscribed nodules supported by a dense connective tissue envelope and well supplied with blood-vessels. These vessels later disappear, and the tumours take on the retrograde changes described above as characteristic of gummata. If softening takes place rapidly, rupture and discharge into one of the bronchi occur. A cavity is then formed in the lung tissue not differing in character from that produced in tuberculosis. The walls of small cavities unite, with the eventual formation of a cicatricial nodule. Large cavities remain patent. The gummata, instead of undergoing destruction by ulcerative, caseous, or hyaline degeneration, may become the sites of deposition of lime salts, with the formation of calcereous nodules. No change in the tissues about the gumma may occur, or a true diffuse broncho-pneumonia may be developed. Diffuse gummatous infiltration is rare, and usually follows the course of the larger vessels as already described. Syphilis is not infrequently the cause of diffuse chronic interstitial sclerosis; and the process consists of the steady and progreeeive development of fibrous connective tissue within the lungs. The sclerosis commences at the root of the lung or in the pleura, and advances along the blood-vessels and the bronchi, invading large areas of pulmonary tissue. The parenchyma of the organ is attacked, and the air vesicles are narrowed in size and at times completely obliterated. The newly formed tissue is sclerotic. The areas affected become dense and hard, and on the surface externally of the organ will be observed an uneven appearance due to contraction occurring in the deeper parts. A large portion of one lobe, and sometimes of two, is affected. The process is usually confined to the base of the lung, rarely approaching the apex. In this respect it shows a notable difference from phthisis pulmonalis.

OSSEOUS SYSTEM.

Both in the early or the late stages of syphilis there may be found some sort of implication of the bones or their periosteal coverings. This is, however, generally observed years after the chancre. Shortly after the development of the first eruption, nodose swellings may occur on the tibia, scapula, sternum, and cranial bones; they usually disappear within a few weeks, and must not be confounded with those occurring later in the disease from gummatous deposition in the part. The earlier lesions are circumscribed areas of hyperaemia with a slight exudation into the periosteum,

but no formation of new cells. Inflammatory osteo-periostitis, gummata, and dry caries are well-known late syphilitic affections of the bones. They may be found at any time after the sixth month and as late as the twentieth year. Any bone in the body may suffer - the tibia, ulna, sternum, scapula, clavicle, and the bones of the nose and face most frequently. One bone may be affected at a given time, or a number may be involved at the same time or one after the other. The lesions occurring in inflammatory osteoperiostitis are true nodes. Any of the bones may be affected; the superficial ones, such as the tibia and skull bones, suffer most frequently. The periosteum and superficial layers of the bone are the parts attacked. The process begins in the connective tissue of the part, and consists of inflammatory swelling, with the production of innumerable embryonic cells. The blood-vessels of the Haversian canals are involved in the process, and the canals are enlarged and filled with plastic exudate resembling bone-marrow. There is considerable determination of blood to the part. Thickening in the tissues occurs with the formation of a distinct tumours involving the periosteum, as well as the parts of the bone underneath. In size the tumour varies from a pea to a walnut, and is soft and doughy to the touch. The overlying skin is freely movable and is not reddened in the earlier stages of the lesion. The nodes rapidly enlarge, the skin becomes red and adherent, the tumour softens, breaks down, and finally discharges upon the surface, with the production of a deep carious ulcer. Dead bone comes away at frequent intervals. The ulcer runs a sluggish, indolent course, after which the cavity closes with the formation of a depressed cicatrix surrounded by a hard bony ridge. At times the nodes do not undergo ulceration, but are converted into new bone extremely dense and hard in its organisation. These growths are persistent and known as exostoses; they may be found in the periosteum, are freely movable upon the underlying bone and later may become adherent to it. Gummata may be seen in and beneath the periosteum, within the bone substance, and in the medullary canal. The long bones, bones of the skull and face, the ribs, and the bones of the fingers and toes, are most frequently affected. Gummata occurring early in the course of the disease are far more apt to be numerous than when developing late. They form rapidly and give rise to the painful nocturnal symptoms hereinafter to be described. When involving the periosteum, gummata can be felt as moderately firm tumours varying in size from a pea to a walnut. They may soften, break down, and discharge outwardly with the production of a typical degenerate syphilitic ulcers, or they may undergo resolution and absorption without the production of such lesions. In the long bones gummata are found most frequently within the medullary canal. The bone is enlarged either locally or throughout the greater part of its extent. The Haversian canals entering the cavity become distended with the degenerated, cheesy products of the gummatous lesions. Though calcification may occur,

the process generally ends by the absorption of the gummy material or the production of carious bone. On account of their peculiar anatomical structure, the process is somewhat different in the flat bones of the skull. The diploë is the part that is most frequently attacked. The gummy deposit may be so extensive as to separate the tables, one or both of which may become carious. Necrosis of the inner table gives rise to serious brain symptoms. In the outer table sequestra are frequently formed and removed by ulceration. Destruction of the scalp tissue takes place and there remains a deforming scar. Dry caries, according to Virchow, is due to syphilis alone; it is most frequently found in connection with the frontal and parietal bones. The process begins as a gummatous deposit about one of the vertical vascular channels in either table or bone affected. Destruction of the osseous tissue about the canal occurs. The gummatous substance disappears by absorption, and depression in the skull results. If both tables be involved at diametrically opposite points, perforation of the cranium may follow. The skin is not involved, there is no suppuration, and sequestrum formation is not observed.

ARTICULAR SYSTEM.

Following the early articular phenomena hereinafter to be described, later in the disease a true synovitis may be observed. This gives rise to the usual phenomena, and effusion into the capsule may be found. The joint generally enlarges, and there is thickening in the fibrous parts due to hyperplasia of their elements. The synovial membrane may become the seat of circumscribed gummata or of diffuse gummatous infiltration. If untreated or improperly so, permanent thickening may result. Complete ankylosis does not often take place, and ulceration with the formation of sinuses is unusual. The knee joint is the part most frequently affected.

ALIMENTARY TRACT.

ORAL CAVITY.

Post-mortem examination not infrequently reveals the presence of syphilitic lesions of the mouth and tongue, the nature of which demands early clinical recognition owing to the extremely infectious nature of the secretions they furnish and the ready means by which the virus can be transmitted from these parts to sound individuals. Any of the various lesions occurring on the skin during the entire course of the disease may appear upon the mucous membranes of the mouth and throat. They are modified somewhat by varying conditions of heat, moisture, and friction to which they are subjected. They are sometimes very obstinate and intractable. Often the oral cavity shows the only evidence that the individual is affected with or is still suffering from syphilis, and the lesion relics in the form of cavities and scars remaining after the disease displays no further activity furnishes valuable evidence as to its previous existence. A chancre may be found on the lips or within the oral cavity with greater frequency than upon any other part of the body, the genitals excepted. Its occurrence here is not in

the innocent only, but is frequently the result of sexual perversions. Chancres appear upon the lips and have the same typical features as elsewhere. They are usually single, but may be double, one appearing upon either lip in direct apposition to each other. The lower lip and the medium line furnish the site of their most frequent occurrence. Fissures, simple sores as from a cold, and cigarette burns upon the border of the lip often furnish the solutions of continuity through which the poison enters. The characteristics of the developing initial sclerosis will to a certain extent be modified by the pre-existence of such lesions. The tip or the anterior half of the tongue should be examined for the presence of a chancre. The lesion usually appears as an erosion or as a nodule superficially seated and indolent in its course. Induration is marked if the tip of the tongue be its seat, but if placed upon the dorsum or sides it may be slight and easily overlooked. There is enlargement of the submaxillary and subhyoid glands, and the degree of induration is often very great. It is important that the chancre should be distinguished from tuberculosis and cancer, both of which are apt to occur in these situations. In tuberculosis there will have during life been a slow onset of the malady, great pain in the lesion, but slight accompanying glandular enlargement; and tubercle bacilli may have been detected bacteriologically. Cancer is not so easily recognised. It commences as a nodule, and the accompanying adenopathy is very great. Its development is slow, and it occurs usually in individuals well past middle-age; while syphilis is apt to occur before that period is reached. Cancer is seen in tobacco smokers, the site of the lesion being that part of the tongue which comes in contact with the tip of the cigar or pipe. Cancer of the lip occurs most frequently near the angle of the mouth; while chancre appears near the median line. A chancre may often be found on the tonsil, here presenting no constant and characteristic features because of the peculiar formation of the tonsillar tissue, this differing in each individual. There is usually much distress in swallowing, and the pain is continuous and severe. The neighbouring cervical glands are very much enlarged and densely indurated. Induration of the tonsil sometimes occurs, but it is not constant. Considerable difficulty is sometimes experienced in distinguishing between the affectiom and a chronic tonsillitis. In the latter there are the usual clinical symptoms and but slight cervical adenopathy. It is comparatively seldom that we find chancres on the gums, cheeks, or soft palate. Chancres of the lips and oral cavity are liable to persist until the development of constitutional syphilis, and then to become converted into moist papules or mucous patches. Syphilis gives rise in the mouth to macules, papules, pustules, tubercles, ulcers, and gummata. Hyperaemia of thepharynx, fauces, and soft palate occurs with or shortly after the appearance of the erythematous syphilide. The hyperaemia is bright or dark-red in colour, usually extensive, and diffuse or bordered

by well-defined outlines. It may also appear in spots varying in size from a pinhead to a threepenny-bit. These spots may be few in number or scattered thickly over the walls of the pharynx, cheeks, and the roof of the mouth. Mucous patches or ulcerative lesions of severe type may follow. The delicate, moist epithelium may be removed by maceration, with the production of raw-looking, ham-red patches varying in size from a pinhead to a threepenny-bit. The ulcers are oval or linear in shape and have a punched-out appearance, with a grayish pus-secreting floor. Papules are represented in the mouth by the mucous patch. That there is no distinction to be made between the two is evident by the readiness with which the papule occurring on the skin, when subjected to heat or moisture, is made to take on characteristics that render it in no respect distinguishable from the mucous patch in the mouth. These mucous patches may be the result of transformation of a chancre occurring in the part, or they may be of primary and independent development. They begin as reddened, circumscribed macules in the mucous membrane. Elevation, due to multiplication of the cells in the substance of the lesion, soon follows. Removal of the epithelial covering by maceration and friction follows, and the lesion takes on a greyish-white appearance, as if the part had been touched with a pencil of nitrate of silver. Mucous patches occur singly or in groups. Often they come out in successive crops. Coalescence may occur, with the formation of an irregular patch of variable size. Neglected cases frequently show the entire roof of the mouth or the inner surface of the cheek covered by a lesion of this nature. Patches occurring upon the cheek or tongue are apt to beget like lesions upon the surfaces with which they come in contact. Favourite sites for their development are just within the angles of the mouth and underneath the tongue. When occurring upon the surface of the tongue, they frequently have a glistening, shiny appearance, and may appear depressed instead of being elevated. This is due to the elevation of the surrounding papillae. The shining appearance is produced by the removal of the epithelium and the exposure of the rete layer beneath. Infiltration of the affected part with small round cells may give rise to hypertrophy of the patch. When such patch is situated on the cheek near the labial angle, it is often deeply fissured, owing to the movement of the parts in mastication, and it then becomes exceedingly painful. It may even pass beyond the angle of the mouth and extend for some distance upon the surface of the cheek. Hypertrophy of mucous patches upon the surface of the tongue give rise to lesions which have very much the appearance of venereal warts. This form has been designated the "toad's-back tongue." Lesions of this class belong to the type of moist papules seen so frequently in syphilis about the anus and vulva. Ulceration of the papules not infrequently occurs, from irritation of the part and infection with pyogenic microorganisms, e.g., irritation from the use of tobacco, either by smoking or chewing, the ingestion of hot or very cold liquids, indulgence in highly spiced

articles of food, and the presence of decaying or roughened teeth. It is seldom that pustules are found in the mouth. They are produced by infection of papular lesions with pyrogenic germs. They are usually accompanied by similar lesions on the body surface. Fissures may be formed in connection with moist papules or independently. The commissures of the lips and the surface of the tongue are favourite sites for their appearance. At the angle of the lips the condition is aggravated by the motion of the parts, and extension of the process to the cutaneous surface may take place as in the case of moist papules. These slow-healing fissures may leave deforming cicatrices. Upon the lower surface of the tongue they generally are found as long linear cracks extending deeply into its substance. Often they appear as if the tissues had been deftly divided by a sharp knife. Their walls are then in close contact, and their separation is needed to reveal the extent of the fissure. Fissures usually follow mucous patches or areas of infiltration of small cells. Tubercles occurring upon the tongue and mucous membrane of the mouth resemble enlarged or hyperplastic moist papules. They are rounded or flattened nodules involving the tissues somewhat deeply, and occurring at points where there is but little pressure, as on the under surface of the tongue. Gummata do not make their appearance in the mouth until a late stage of syphilis. They may occur in any part, but most frequently attack the tongue. They begin in either the deep or superficial tissues, and are apt to run a much more rapid course than when occurring elsewhere upon the body. The superficial variety is first noted as a small, round, reddened nodule appearing in the mucous membrane. The nodule is slightly elevated and is moderately firm to the touch. The lesion may increase in size slowly, but its most frequent course is to enlarge with startling rapidity. The centre becomes necrotic, caseous degeneration follows, and the roof wall, which at first is tense, is broken down and a gaping ulcer results. There may be but one or there may be several of these lesions scattered over the tongue, the hard palate and the cheeks. The gummata are seldom painful, and often are not discovered until softening and ulceration have occurred. Gummata originating in the deeper structures, such as the muscular tissues of the tongue and bones of the hard palate, are apt to be much more formidable and severe in the course they pursue. The tumour usually occurs singly. Its onset is insidious and painless. It is circumscribed, indurated, firm in outline; and it varies in size from a hazelnut to an olive. Degeneration and ulceration occur at times with great rapidity. Perforation of the palate may take place within a week from the first appearance of the nodule. If not promptly checked, the process may go on to more or less complete destruction of the roof wall. Ulcers, in which a marble may be hidden, destroy with the same rapidity the tissues of the cheek and tongue. The ulcers are round, oval, linear, or irregular in shape. Their edges are elevated and roughened or

sometimes undermined. They are not very painful and the prognosis is good. Repair of the soft tissues occurs with the production of cicatrices that are markedly deforming. Many of these patients are found to be wearing an obturator for the relief of the destruction of the hard palate; and post-mortem examination shows that early and efficient treatment in these cases is of the greatest possible benefit.

OESOPHAGUS.

It is only in exceptional cases that the oesophagus is found to be syphilitic. Gummatous infiltration of its walls, resulting in cicatricial stenosis and narrowing of the lumen, have been described.

STOMACH.

The behaviour of the stomach in syphilis has not hitherto perhaps received the investigation it deserves. Gummata have been found at autopsies, and in the subjects who presented no appreciable gastric symptoms during life. Gummatous infiltration of limited or extended areas of the mucous or submucous tissues may result in considerable thickening of the walls of the organ.

INTESTINES.

In the case of the intestines the rectum suffers with greatest frequency and will presently receive special description as regards its lesions. Elsewhere the walls of the intestine may become the seat of gummata of a superficial character, which during life cause little or no disturbance.

At any stage of syphilis lesions of the ANUS and RECTUM may be observed. Chancres are frequently found here, infection in women being due to displacement of the penile organ, and in men occurring as the result of sexual perversion. If the chancre occur within the sphincter ani, it is seldom discovered during life. On the anal border or upon the perianal surfaces it presents itself as a firm, flat or spherical lesion, somewhat resembling a small pile. It may also appear as an eroded surface or as an anal fissure. Macules or papules are the forms of the early consecutive lesions occurring about the anus, and usually are seen in conjunction with the appearance of the first macular exanthem. During life pruritus may be excruciating. Papules, in consequence of the heat and moisture incident to the part, are liable to be converted into mucous patches and condylomata. The secretion furnished by such lesions is extremely contagious in character, and the odour arising therefrom is horribly offensive. The late rectal syphilitic lesions are more often seen in women than in men, and consist of gummatous infiltration of the parts and the free development of fibrous connective tissue. Any point within the rectum may reveal the presence of gummata, which may be single or multiple and localised or extensive in distribution. Diffuse gummatous infiltration may envelope the entire surface of the gut in a broad band, or extend along one of its sides for a considerable distance. When small, gummata are apt to be numerous. Their point of origin is in the mucous or submucous tissues. In their earlier development they feel to the tip of

the finger like smooth, round, firm nodules set somewhat deeply within the rectal tissues. Later they become elevated, less firm, and often develop into papilliform bodies. Sometimes ulceration occurs. When the gummy infiltration encircles the gut, stricture is nearly always found. This is accomplished by the absorption of the gummatous material and the production of fibrous connective tissue. A chronic proctitis usually accompanies such stricture, and the discharges from the bowel are liquid in character. Steady and progressive contraction of such strictures is apt to continue until the lumen of the bowel is so greatly narrowed as to interfere in a dangerous degree with the discharge of the intestinal contents. Finger examination shows the lumen narrowed in various degrees, a roughened, corrugated, dense mass of contractile tissue encircling the gut, a pouch-like expansion above it, and tongue-like projections of rectal tissue beneath. The term "ano-rectal syphilomas" has been given by French syphilographers to strictures arising in this manner. In the case of young and old syphilitic women, long after the symptoms of the disease have disappeared, there may be found a form of rectal stricture characterised by the formation of dense fibrous tissue without preceding inflammatory conditions or exudative products taking place in the parts.

CUTANEOUS APPENDAGES.

Syphilis is well known to attack the hair and nails, and the more important features of lesions thus arising may here be described.

HAIR.

During the course of a syphilitic attack the nutrition of the hair filaments may be impared in so slight a degree as to give rise only to a certain amount of dryness and lack of lustre, or the process may be so severe as to bring about an extreme and most unsightly alopecia. These syphilitic alopecias are important from a diagnostic point of view, because of the assistance they render in arriving at exact conclusions regarding the existence of the disease. They appear as the result of one of two processes: either the hair falls as the result of defective nutrition, with no structural change occurring in the part from which it arises, or there is a preceding organic change in such part. The alopecial in the first form may be regarded as resulting from a primary process, while in the other it is of a secondary character. In the primary form the hair may come out slowly or very abruptly. There may be a gradual thinning of the hair of the scalp and of other parts of the body, a few filaments only coming away each day, until the complete loss becomes decidedly conspicuous, or the process may be characterised by the development of numerous bald patches no larger in size than a shilling. When these patches occur upon the scalp they affect the back and sides of the head more than other parts. In these regions the bald areas are set so thickly as to almost occupy the entire surface. They give to the hair of the head a characteristic ragged appearance not seen in any other form of baldness. The

patches are irregular in shape; the surface is scaly and often set with a few dead stumps of hairs, as in ringworm, and the colour is a dead grayish-white. The eyebrows, beard, hairs of the public region and of the axillae may share in the process. Usually the hair in these parts does not fall independently of that of the head. The loss is apt to be asymmetrical, and when this occurs in the case of the eyebrows or beard, results in peculiar disfigurement. The eyelashes are not often affected. The hairs remaining are loosened and can be readily removed from their insertions. This form of alopecia is by far the most common and occurs most frequently in the early stages of the disease, accompanying or shortly following the appearance of the syphilides. The secondary form of syphilitic baldness results from the previous changes in the integument due to the presence of syphilodermata. Such syphilodermata may be in the form of macules, pustules, papules, tubercles, ulcers, or gummatous infiltration. The loss of hair occurs as the result of partial or complete destruction of the hair follicles. The process belongs to a late period of the disease, but in the severe forms of syphilis it may be of early occurrence. The alopecia is permanent if the hair follicles be entirely distroyed. If destruction is not complete, there may be a partial and stunted growth. Limited areas of the scalp are usually affected.

NAILS.

Any stage of syphilis may show lesions of the nails. The disease may commence in the nail itself, and its manifestations throughout be confined to the nail substancem or it may begin in the soft parts and later extend to the nail tissue. The first form is called syphilitic onychia and the second syphilitic paronychia. The changes in the nail substance known as onychia are characterised by loss of lustre, formation of puncta, striae, brittleness, and deformity. These changes are due to disturbance of nutrition, and are common in the earlier periods of the disease. Careful examination of the nails shortly after the outbreak of constitutional manifestations will usually show perceptible changes in their structure and appearance. The nail often appears dead, and along its border a pale-white line shows where nutritional changes are taking place. With the atrophic condition there may be an accompanying hypertrophy of the parts of the nail, leading to the formation of longitudinal lines and ridges much elevated above the surface; or the nail may be greatly thickened throughout, while over the surface characteristic striae and puncta, due to the accompanying atrophic condition, can be detected. These changes may lead to complete or partial removal of the nail. One or all of the nails may suffer. The nails of the fingers and those of the great toes are most often attacked. Paronychia is syphilis begins as an inflammatory condition at the base or sides of the nail. It may be superficial, only the epidermal structures being involved, or it may extend so deeply as to involve the distal phalanges of the digits. The parts are greatly thickened, and at times there is the

production of a mass of new tissue having a decidedly verrucous appearance. Fissures and excorations form. The nail is affected as described under onychia. It is usually first elevated at one side, and then gradually pushed off. The process may occur at any time during the first two years after infection. The nails of the fingers suffer more frequently than do those of the toes, owing probably to their exposed position and their greater liability to injury.

EAR.

It appears to be comparatively seldom that cases of aural syphilis are seen; but when the ear is attacked, especially in its deeper structures, it is apt to suffer severely. Chancres, due to kissing or biting, in the external ear, and in extremely rare cases in the meatus, have been observed. In the early stages of the disease the integument of the auricle may show any of the consecutive lesions insident to that period. At a later stage the substance of the lobe may become the seat of gummata. Such deposits may occur within the lobule or upon either surface of the cartilage, and the affection is apt to pursue a rapid and destructive course. Removal of a large part of the lobe may take place. Gummatous nodules in the integument may give rise to superficial ulcers. Inside the canal early consecutive lesions may be seen. They may be moist or dry and accompanied during life by torturing itching. A dry form of seborrhoea developing in the part is sometimes seen in early syphilis. The accumulations of sebaceous material may be sufficient to effectually plug the passage. Intractable ulcers also appear within the walls of the canal. Such painful ulcers have a free discharge. Exostoses occur at the meatus, but some doubt exists as to their being due to syphilis. The bony growths are not distinguishable from similar lesions occurring in individuals free from the disease. Condylomata are by far the most frequent form of syphilitic lesion found in the meatus. The affection occurs with the greatest frequency in the early stages of the disease, and severe ulceration is apt to follow. The lesions begin as dry papules the size of a millet-seed and enlarge to that of a pea. The papule becomes moist, the epithelium is macerated and removed, and a typical secreting vegetation remains. On the drum of the ear macules and papules may be found. If ulceration of the lesions takes place, perforation of the membrane is apt to result. Small gummata may occur in this structure. Affections of the tympanum are not well understood. Its intimate relation with the nasopharynx, by means of the Eustachian tube, makes it liable to participate in the accidents arising in this region. This usually happens in the form of a diffuse catarrhal inflammation of the lining membrane of the vacity, with closure of the tube and the production of partial or complete deafness. This form of serious inflammation is frequently seen in children suffering with hereditary syphilis. A true suppurative inflammation due to syphilis may arise. It is distinguishable in no wise from suppuration of the middle ear due to other

causes, save that local treatment has little or no effect upon it, while it responds readily to specific medication. A small-cell infiltration of the parts may occur as an indepentent affection or follow one of the above-described forms of inflammation. It gives rise to a considerable thickening of the walls, and may produce ankylosis of the ossicles. Otorrhoea is observed. The affections of the labyrinth are not well understood. Thickening of the lining membrane may result from hyperplastic inflammation of the parts. Gummata may be discovered.

EYE.

Syphilitic lesions may be seen in any part of the ocular tissues, the neighbouring soft parts, and the orbital bones. Their importance calls for detailed consideration. Regarding the orbital bones, gummata may develop in the periosteum or in the bones themselves, and, in addition to the usual pressure symptoms, occasional displacement of the globe. Nodes are not infrequently found. The bones may be affected by periostitis, osteitis, carious degeneration, and necrosis. The inflammation excited by such processes may extend to the eyeball and give rise to a deep-seated or superficial cellulitis. Abscess may follow with discharge through fistulous tracts in the eyelids. There may be implication of the adjacent cerebral structure. A chronic catarrhal condition may be seen in the lachrymal gland and ducts; it is generally associated with some thickening of the Schneiderian membrane or disease of the nasal passages. Stricture of the lachrymo-nasal duct is apt to follow. A chancre may be seen on either the inner or outer surface of the eyelids; and the lesion is here characterised by the same features as when occurring elsewhere. Usually there is considerable oedema of the parts. Enlargement of the preauricular, parotid, and submaxillary glands on the affected side constitutes the bubo. Both surfaces of the eyelids may show the early consecutive lesions, but this is rare. Upon the mucous surface they are produced only after the part has been irritated in some manner. Mucous patches appearing upon the conjunctiva are seldom severe. Gummata may be found upon the eyelid, usually late in the course of the disease, and chiefly along the free border. In size they vary from a pinhead to a pea. They must be distinguished from cystic or fibroid tumours. Gumata generally involve all the tissues of the lid, while either of the forms of neoplasm noted are frequently confined to a single layer, as to the skin or conjunctival lining. Syphilitic subjects not infrequently show injection and inflammation of the ocular conjunctiva; and with the same an iritis of the same eye usually occurs. A few cases of chancre of the part has been described. Consecutive lesions may occur in connection with the first skin eruption. The lesions appear as circumscribed macular spots or small papular elevations, coppery in hue and without injection. They are seldom numerous. Gummata are rare. They are found oftenest in the palpebral conjunctiva, but may develop in the coular portion at the border of the cornea. The neoplasms vary in size from a pinhead to a pea, and are usually spherical in shape. T

he inner surface

is often reddened, while the outer is whitened or yellowish. They are liable to terminate in ulceration. If numerous, the nodules may interfere with the nutrition of the cornea in sufficient degree, by pressure upon the lymphatics, to cause destruction of the part. It is more often in congenital than in acquired syphilis that we find the cornea involved. A diffuse interstitial keratitis sometimes appears, giving to the part a cloudy, muddy appearance. The process begins at the centre and spreads gradually to the border of the cornea, or it may follow the reverse direction, beginning at the periphery and advancing towards the centre. It is chronic and lasts for years. A true punctate keratitis may arise. In this form the lesions are pinhead-sized, grayish-looking deposits. They are never vascularised and never ulcerate. Gummata may be found. Syphilitic affections develop in the sclerotic in the form of episcleritis, parenchymatous scleritis, or gummata. Episcleritis occurs as a superficial congestion of the sclerotic. It is never extensive, though several patches may be discovered at once upon the visible portion of the membrane. The conjunctiva is usually injected at the same time, and in a measure obscured recognition of the process in the sclerotic. Parenchymatous scleritis is deeper in its location, and exudation is marked. The conjunctiva is swollen and elevated. An ititis usually accompanies it, and the process is of a chronic sort. Atrophy and thinning of the tissues may follow, but ulceration never takes place. Gummata developing in the sclerotic appear first as small reddened, interstitial deposits. If unchecked in their course, they enlarge, extend into the other coats of the eye, and may proceed to destruction and removal by ulceration of the globe. Inflammation of the iris due to syphilis is an exceedingly common disease. It appears early in the course of the malady, usually after the subsidence of the skin eruptions, but it is by no means rare at later periods. One eye only may be involved, or both may suffer in succession or simultaneously. There may be recurrences of the condition. The pupil is small and of a dull, hazy colour; the iris is discoloured and slightly swollen; the conjunctiva is lightly or deeply injected; the lids are oedematous, and there is more or less lachrymation. The iris may become attached to the crystalline lens on account of posterior synechia. Serous iritis may give rise to exudation into the anterior chamber of the eye. The aqueous humour then becomes muddy and semigelatinous in consistency. The iris and lens are pushed back by the exudate, nodular lesions may occur in the iris or on its surface, due to organisation of the plastic material furnished by the inflammatory process. The membrane may be thickly covered with these bodies, and by their means become firmly attached to the capsule of the crystalline body. The convexity of the lens is exhibited by the iris in such cases. Syphilitic affections of the ciliary body are sometimes observed. Cyclitis or inflammation of the ciliary body is somewhat rare, but an exceedingly grave disease. The affection may be serious, plastic

or gummatous. There is ciliary injection, serious exudation into the vitreous humour, and the iris and choroid are usually implicated in the process - in which case the affection is designated an irido-choroiditis. When the iris is not involved it is often retracted towards the part of the ciliary body affected. Such retraction frequently results in considerable widening of the anterior chamber. Particles are visible floating in the vitreous humour. Minute deposits on Descemet's membrane can be seen. The aqueous humour may become dark and turbid. Posterior synechiae frequently result in glaucoma. Gummata may extend into the ciliary body from the iris or develop in it primarily. Atrophy of the body usually results after gummatous infiltration. Regarding the choroid, it may be first of all noted that choroiditis is next in frequency to iritis as a syphilitic affection of the eye, and that it is often associated with it. Two forms have been noted, according to the location of the ailment. The first form is confined to the anterior portion of the choroid and is always accompanied by iritis. The second affects the posterior portion of the membrane only. In either case there is exudation into the posterior chamber with resulting cloudiness of the vitreous humour. Flocculi floating free in the anterior part of the chamber, are visible. Reticulated bands, sppearing like cobwebs, may be formed by the plastic exudate. Small yellow specks may be seen upon the fundus or upon the wall of the posterior chamber. Atrophy of the cell elements, at the place where these bodies are situated, is apt to follow. The retina is frequently affected in conjunction with the choroid. The optic nerve usually shows a hyperaemic condition. True gummata are perhaps never observed in the choroid. Choroiditis occurs late in the course of the disease and generally in subjects past middle-age. Syphilitic affections of the retina are not unknown. Retinitis occurs without previous implication of the choroid only in very rare cases. One or both eyes may be affected. The retina appears as if obscured by a veil, the retinal vessels are hyperaemic, the fundus is indistinct, and the disc engorged. The affection may be confined to the fundus and the parts in the near neighbourhood, or the peripheral portion of the retina may alone be affected. Syphilitic retinitis may be acute, subacute or chronic. A peculiarity of the condition is that it is apt to occur when there are no other symptoms of the disease manifested elsewhere in the body. The optic nerve may be affected either within the orbit or within the cerebral tissue. The inflammation develops usually in connection with retinitis. Choked disc is observed. There is engorgement of the vessels; the nerve is greatly swollen and infiltrated; its colour is red or reddish-grey, and its retinal border is wholly obliterated. Usually but one nerve is affected.

NERVOUS SYSTEM.

Syphilitic nervous lesions may be found at the autopsies of patients dying at any period in the course of the disease after the development of constitutional

symptoms. Severe lesions, however, are seldom seen at an early stage. More often they are delayed until an extremely late period, as the end of the first or second decade. Men are more apt to suffer than women, owing to the greater care, overwork, and worry that they experience. Usually the victims of nervous syphilis are not yet past middle life. The belief is current that nervous affections are prone to develop in cases exhibiting but few of the earlier manifestations of the disease. This statement, however, lacks confirmation. It will probably be found that, owing to the mildness of the earlier symptoms, treatment was neglected or delayed, and the disease allowed therefore to thoroughly undermine the patient's constitution. Nervous affections due to organic and structural change can be referred to lesions occurring in the bones enclosing the nervous organs, the meningeal coverings, the nervous tissue itself, or the blood-vessels ramifying therein. Gummata, exostoses, carious and necrotic contres developing upon the inner surface of the vault or vertebral canal, or in the bones enclosing these cavities, are a fruitful source of nervous affections in the pressure effects they are apt to produce. Direct extension of the disease in these parts may give rise to inflammation of the brain and spinal cord. The meninges of the brain and cord are subject to gummatous infiltration, either in localised deposits or throughout extensive areas. Diffuse or circumscribed inflammatory patches arise in which the heightened vascularisation results in marked thickening of the membranes. The dura mater, owing to the free development of connective tissue entering into its composition, is most frequently attacked. The gummatous formation may begin in its substance or be the result of extension from neighbouring osseous tissue. The meninges of the brain are more apt to suffer than those of the cord, Large areas of one or both halves of the brain may be affected with a meningo-encephatitis from the extension of the process.

BRAIN.

The brain may be the seat of gummata, which are more often found in the cortex than in the deeper portions, and in the cerebrum than in other parts. These tumours are single or multiple and vary in size from a mustard-seed to an olive. They often occur in very great numbers, and are nearly always found accompanying similar lesions in the meninges. In their early stages, when seen in post-mortem examination, the lesions appear as small circumscribed and translucent bodies imbedded in the substance of the brain tissue. As the gummata enlarge they undergo the caseous degeneration seen in like lesions elsewhere. They are usually surrounded by an inflammatory area in which increased development of neuroglia occurs. Resolution is usually accompanied by absorption of the product, or the neoplasm may undergo calcarous or cystic degeneration. Gummata are found but rarely in the deeper structures, such as the ventricles, optic thalamus, internal capsule, and corpus striatum. Syphilitic affections of these parts are more apt to be expressed in some form of arterial

disease. The middle cerebral artery or one of its branches suffers the most frequently, either in the form of a specific endarteritis or periarteritis. Occlusion of the blood-vessels by thrombi may take place, or the vessel may rupture and haemorrhage into the surrounding tissue result. Aneurysmal dilatations or poucees of the arterial walls may be produced by the disease.

SPINAL CORD.

The spinal cord is less frequently syphilitic than the brain. The lesion may begin in the bones, in the coverings of the cord, or in the cord itself. Gummata and a diffuse proliferation of the connective tissue elements are the forms of syphilitic affection most likely to occur.

H E R E D I T A R Y S Y P H I L I S .

In view of the great interest and importance of the subject, the post-mortem lesions of hereditary syphilis call for separate and detailed consideration.

PLACENTA.

The subject would scarcely be complete without some reference to syphilis of the placenta, on account of its relation to the abortions and miscarriages which are so common in this disease. Prior to the erudite disquisition of Fraenkel (Arch.f.Gyn.,1873,Vol.v.,p.1) on the subject little or nothing was known about it. He described the microscopic changes as consisting of increased size and weight of the placenta, closer and firmer texture of the placental tissue, and presence of old and recent extravasations of blood in all stages, opacity and thickening of the decidual covering and of amnion and chorion, which are in places adherent to each other. Microscopically it was found that the placental villi were filled with small nucleated cells, which were especially abundant in the centre of the villous spaces along the axis where the vessels usually take their course. Knob-like processes stood out as enlargements at the ends of the villi. Our author explains these changes as follows: Under the influence of syphilis, - he takes as his criterion of the disease the presence of the osteochondritis described by Wegner (loc. cit.) - cell-proliferation begins within the villi, which normally have only a sparse supply of cells. These new cells excite proliferation of the cells of the connective-tissue stroma and of the epithelium. This proceeds to such an extent that it leads to compression of the vessels (Henning was the first who called attention to the intimate relation of the cell-growths to the vessels; according to him, the obliteration or compression of numerous cells of the villi interferes with the mutual interchange of gases between the maternal and foetal blood, causing fatty degeneration of the villi and, if the process is

extensive, the death of the foetus), interfering with the circulation, and finally obliterates them. The vascular spaces into which the villi dip become filled up and narrowed, and often disappear. In this way, and also by reason of the thickening of the epithelium, the interchange between the maternal and foetal blood is interfered with, and at last is ended. Should this process become spread over the whole placenta, the foetus dies before it is complete. If it be limited to circumscribed areas, it may continue to live for a longer or shorter period. Fraenkel's researches, though important and interesting, require repetition and confirmation. Syphilis in the parents will manifest itself in the children in one of several ways, which are determined chiefly by two factors, namely, first, the length of the interval between the infection of the parent and the date of conception; and, second, the thoroughness of the treatment of the parents during that interval. To these may be added as subsidiary, but still of definite importance, a third, the type of disease which has affected the father or the mother, whether mild or severe, benignant or malignant. The various points brought forward under syphilis and marriage in a preceding section show that the danger to the offspring in untreated cases, and in those where conception has occurred during the early secondary period of the disease, is of the most extreme gravity. (Kassowitz says that women who are not treated all pregnancies occurring within the first three years of their infection terminate either in abortion or in the birth of children who survive only for a few weeks or months. In "Le Brogrès Mèdicale" of November 24th., 1877,-p.882, - Parrot cites Weber as having treated 35 pregnant women by mercurial inunction; they all went on to full term under normal conditions. Among those treated with mercury and iodide of potassion, but who on account of their indolence to the former drug took chiefly the latter, 20 per cent. aborted; when the mixed threatment was carried out regularly 15 per cent. aborted; His studies were made on 109 syphilitic pregnant women. Parrot himself says, - ibid., - that abortion occurs in about one-third of all syphilitic women, and that syphilis should always be suspected when this accident occurs several times successively. Furthermore, according to him, the date of abortion depends on the age of the syphilis of the woman; it is most to be feared during the evolution of secondary symptoms, particularly when they are grave; there is more probability that it will occur when infection has preceded pregnancy than when it occurs during its course; nothing is so much to be feared as contamination of the ovule; the nearer the date of infection of the mother approaches to full term the fewer the chances of abortion; it is not likely to occur when the mother is infected at five months even.) In such cases the usual result of pregnancy is abortion at from the first to the fifth or sixth month, - Trousseau, Babington, Von Baerensprung, and others were of the opinion that abortion results from the death of the foetus, - the

foetus sometimes exhibiting the evidences of the disease in the shape of large bullae upon the plams of the hands and soles of the feet, or in the presence of characteristic visceral lesions, but while as often showing nothing distinctive. It has generally undergone more or less maceration, and the skin is of a congested and purplish colour and is readily detachable. Cory was of the opinion that in not a few cases it is possible that the effect of syphilis may be to effect so early an abortion that the case is simply regarded as one of delayed menstruation or of menorrhagia. Such a conception would, however, be competent to infect the mother, and might seem to explain cases otherwise involved in obscurity, as, for instance when a woman married to a syphilitic man, but without issue, remarried a man with no history of syphilis, and yet gives birth to a syphilitic child. In such cases there would be no history of direct infection and none of pregnancy, and only two modes by which she could have contracted the disease, and the father, - the second husband, - might be unjustly suspected. At least one-third of all syphilitic children are, in the opinion of Kassowitz (loc. cit.) and others, born dead. As time goes on, however, and the intensity of the parental disease is lessened, or in cases where appropriate treatment has been applied, either the abortion occurs at a later period of pregnancy or the children are brought forth alive. When then, however, and although at birth they appear to have no evidence of the disease, their chance of escape is but small. One-fourth of them die within the first six months. It they survive that period, the chances for life are slightly in their favour, but those for health or freedom from deformity and disease are still overwhelmingly against them.

VISCERA.

LIVER.

Despite Parrot's experience, confirmed by several others, that visceral affections are not common in intrauterine syphilis, there can be no doubt that they occasionally occur. Amongst these, a parenchymatous infiltration of the liver, of a fibroplastic nature, and for the most part without large gummata, is the most common, instances of the same having been reported by Baerensprung, Gubler, Rochebronne, and others. It is sometimes attended by anasarca and similar lesions in the lungs; and, if not actually present at birth, it may develop soon afterwards, and may then lead to jaundice and death. Gubler's description of the condition of the liver in foetal syphilis has since its publication, in 1852, served as a basis for all others. According to him, the affected liver is always larger than normal. Its surface often presents thickening of its capsule. The hepatic tissue is harder and more elastic than normal; it rebounds when a piece is dropped upon the post-mortem table. It presents the yellow colour and the semitransparency of flint. He also described small white granulations, which he compared to grains of wheat, and which are scattered throughout the parenchyma. Cornil says that these small granulations are formed by accumulations of embryonic cells in the spaces which separate the hepatic acini. The latter,

in the normal state are in contact except at the prismatic spaces which are formed by their union, in which spaces the hepatic capsule forms an envelope to the afferent portal vessels of the lobule. It is in these spaces that the round lymph cells form and collect into small lobules representing microscopic gummata. The portal veins also present thickened walls with newly formed cells in their external coverings. The condition may be accompanied by local peritonitis. The gummata of the liver sometimes observed in congenital cases differ in no wise from those found in the adult.

SPLEEN.

Infiltrations of the kind noted above are sometimes found also in this organ; and Parrot tells us that the spleen is after the osseous system the part most often attacked. According to Cornil (Simms and White's translation of Syphilis,p.410), it is always hypertrophied in hereditary syphilis. The capsule is thickened and inflamed, and the splenic tissue is harder than normal. (Gee (Trans.Med.-Chir.Soc.,March 26,1867) has found the spleen so enlarged that it could be felt during life in about 50 per cent. of his cases in congenital syphilis. In about 25 per cent. the enlargement is really great. Sometimes, in addition to the enlargement of the spleen, there is enlargement of the liver and of the lymphatics. These cases seldom survive. The degree of splenic enlargement may be taken as an index of the severity of the cachexia, with the exception that once enlarged the spleen may remain enlarged for years. Gee found the enlargement to be a simple hypertrophy with considerable thickening of the capsule; on one of Barlow's cases (Brit.Med. Jour.,Jan.20,1877) there was simply slight enlargement with hardness, no waxy degeneration, and no gummatous infiltration.

PANCREAS.

The behaviour of the pancreas in hereditary syphilis appears to have been first investigated by Birch-Hirschfeld in 1875. He examined the bodies of 23 newborn children that bore unmistakable evidence in the bones of syphilis, and in 13 cases found the pancreas more or less altered. Of these 23 cases 10 were macerated, and amongst these but 2 showed disease of the pancreas, while in the 13 remaining cases, which died either during birth or soon after, the pancreas was diseased in 11. In the most marked cases the organ was much enlarged, its weight doubled, its tissue firm. On section it presented a glistening-white appearance, and resembled more a fibroid than a glandular structure. Microscopically the interstitial connective tissue was found greatly increased, especially between the larger lobules. This extreme alteration was found in 7 cases. In 6 the changes were less marked. In some cases a part of the organ, especially the head, was decidedly altered, while the rest was less markedly changed. Our author remarks that this interstitial change in the pancreas bears the fullest analogy with the interstitial changes in other organs, especially the liver, which have long been recognised as the product of syphilitic infection, and, while it is not constant, it

comes next in frequency to the splenic anatomical changes. His observations have been confirmed by others. In cases in which the secreting apparatus is mostly destroyed, the secretion of the pancreatic juice must be impossible; this must have a disastrous influence upon the nutrition of the infant, and probably be responsible for the stomach and intestinal troubles so often observed in cases which survive.

THYMUS.

There is little known regarding the condition of the thymus in syphilis. In certain instances an abscess is found, but by no means constantly. The organ sometimes contains a considerable amount of pus, which sometimes cannot be distinguished from those arising from non-syphilitic conditions.

HEART.

Gummata have been found in the heart, and Coupland has reported a case in which the muscular walls were thickened and hardened and showed under the microscope an almost universal infiltration of small round cells among the muscular fibres; the kidneys, although normal microscopically, were seen to be undergoing similar changes, and there was an unnatural firmness of their substance.

RESPIRATORY ORGANS.

In early cases of congenital syphilis the PHARYNX, LARYNX, TRACHEA, and adjacent parts may show signs of ulceration in resulting in extensive loss of substance, followed by correspondingly extensive cicatrisation and stenosis. The destruction of the PALATE, so characteristic of syphilis, is undoubtedly sometimes the result of hereditary disease, but more often in its later forms. Mackenzie found that, of 30 cases of deep ulceration of the palate, pharynx, and nasopharynx, 14 occurred within the first six months of life, the remainder occurring at periods more or less advanced towards puberty. The occurrence of so large a proportion so early seems incredible. Examination of the LUNGS of the syphilitic foetus born before term, and of syphilitic children who live a few days, reveals in the lungs nodules or small tumours, usually superficial, sometimes deep, hard, isolated or in groups, link, gray, or red in colour, with scattered whitish or yellowish points, varying in size from a pea to a small walnut. On section they are spherical or lobular, and present the same small whitish points throughout. These nodules are scarcely prominent, and represent simply a part of the lung more or less considerable in a state of special lobular hepatisation. At other times practically all the lobe is involved. The dense altered part usually sinks immediately in water; it is colourless, gray or white, both on its surface and on section. The PLEURA is always affected, being thickened and inflamed. This condition is called by Virchow "pneumonia alba;" white hepatisation. The lungs are of large size and bear the impress of the ribs on their surfaces.

KIDNEYS.

Coupland has reported 2 cases of hereditary syphilis, - one of them a girl of 13 with marked

hereditary disease, and the other a girl of 18 in whom the diagnosis of syphilis was fully established, - both of which had kidneys showing the lesions of parenchymatous nephritis. According to Barlow, patients with congenital syphilis are very susceptible to or are predisposed to nephritis, while Mahomed thinks that cases of nephritis due to syphilis are primarily instances of amyloid degeneration. Parrot found the kidneys on section studded with numerous small tumours, varying in size from a pinhead to a cherry-stone. The smallest were white, and the larger were yellow in the periphery and reddish at their centre. The lesion consisted primarily of a circumscribed or diffuse infiltration of round embryonic cells with others of fusiform shape into the connective tissue framework, followed secondarily by compression or destruction of the tubules and colloid degeneration of their epithelium. In the first stage the organs were enlarged; in the second, general atrophy sets in, and they are finally considerably reduced in size. Bradley (Brit.Med.Jour.,Feb.4,1876) has reported the case of a child, aged four months, in whom a well-marked syphilitic eruption and an attack of Bright's disease of an acute form were coincident. Cases of enlargement, of fibroid, fatty and gelatinous degenerations of the SUPRARENAL CAPSULES have been reported.

TESTICLE.

The lesions of the testicle in hereditary syphilis have received careful investigation at the hands of Henoch (Schmidt's Jahr.,178,No.4), Cornil (Syphilis,p. 421), Parrot (Rev.Mens. de Medic.et de Chir.,Feb,,1878), Hutinel (Ibid), North,(Med.Times & Gaz.,1862,Vol.i.,p. 403), Bryant (Ibid.,Dec.,1863), and others. The syphilitic manifestations was found to consist of a true interstitial orchitis, very closely resembling that seen in the syphilitic testicles of adults. Hutinel's investigations, based on 10 cases, showed the testicles slightly enlarged, and harder than normal, the scrotum pendent, the epididymis normal, the tension of the tunica vaginalis and tunica albuginea slight. The basis of the lesion is in a collection of small round embryonical cells resembling lymph-cells, arranged in the connective tissue around the arterioles which come from the tunica albuginea. This may be accompanied by more or less marked diffused interstitial orchitis, or there may be only a thickening from bew formation of small round cells on the connective tissue of the testicles. Cornil found the seminal ducts deparated by numerous round or fusiform cells. The disease usually occurs at from two months to three years of age; both testicles are usually involved, and are enlarged, hard, inelastic, and frequently nodulated. Henoch has reported 7 cases of syphilitic disease of the testicles in children from 3 months to 2½ years of age; and Taylor has described 5 similar instances.

BONES.

Prior to Wegner's (Virchow's Arch.,1870,Bd.50, S.305) important contribution to the literature of hereditary syphilis the possibility of hereditary osseous affections was either ignored or denied by the

various writers on the subject; Diday (op.cit.) for instance says that osseous diseases are "so rare in children with inherited syphilis that the annals of medicine scarcely offer five or six well-authenticated cases of caries or periostitis"; referring to this statement, Hutchinson (Illustrations of Clinical Surgery,1875,p.47) remarks: "So different has been my experience from this that I may say that we are scarcely ever without a severe example of it in the wards." Valleix, Bargione, Ranvier, and Guèniot had indeed recorded cases of bone disease occurring at the points of junction between the epiphyses and diaphyses and in the costal cartilages; but it remains for Wegner first fully to describe the pathological changes which occurred there, and to differentiate them from those due to rickets or scrofula. In the course of his investigations he recognised three stages of alteration in the long bones: First, - while in the normal state the boundary of the hyaline cartilage is distinctly marked by a line which indicates the direct transformation of the cartilaginous tissue into a spongy tissue, the unaided eye being unable to distinguish a spongio-calcareous layer, in newborn syphilitic children, on the contrary, the bones seem to have a spongio-calcareous layer interposed between the bone and cartilage, measuring two millimetres in thickness. This is a zone of calcifying cartilaginous material more extensive than in the normal state. Second, - these same changes become more distinct and more extensive. The unnaturally thick layer of calcareous material continues to grow. There is a proliferation of the cartilaginous trabeculae, abundant calcification of the cartilage, too early and irregular ossification of the intercellular substance of the cartilage, and at the same time an arrest of the normal formation of bone which should be going on from the epiphyseal cartilage. Third, - there is now added, by extension of these processes, a thickening of the perichondrium and periosteum at the extremities of the long bones and at the junction of the ribs with the costal cartilages. In consequence of the interference with nutrition occasioned by these changes atrophy and fatty degeneration of the cartilage cells occur, and they form between the epiphysis and diaphysis a necrosed mass which irritates the living bone. This causes osteomyelitis, which frequently results in a separation of the epiphysis. Occasionally pus is produced in such quantity as to perforate the periosteum, escape into the surrounding tissues, and become superficial. This has been termed by him an orteochondritis. For the most part the investigations of Wegner were confirmed, in 12 cases, by Waldeyer and Köhner (Virchow's Arch.,Bd.55, S.367); but they interpreted the changes as arising rather from the formation of gummatous tissue between the epiphysis and diaphysis than from an osteochondritis. The tissue-death which occurs later, the atrophy of the cells, etc., they compare with the same modifications which are observed in syphilomatous conditions. These observations were extended by Parrot (Soc. de Bofl.,June 1 1872; Soc.Anat.,1873,p.92;Arch. de Phys.,1876, Vol.111

pp. 138,139; Rev. Mens. de Méd. et de Chir.,1877;Trans. Path. Soc.,1871,Vol.xxx,p.339) in a series of important monographs, in which he attached especial importance to the formation of osteophytes, which, according to him, in the first stage envelope the disphyses of the long bones, especially at their inferior extremities. In the succeeding stage the new bony layers are more porous; a gelatinous degeneration affects the epiphysial cartilage and the spongy bones at a point where they are in contact; the epiphyses tend to separate from the disphyses. This solution of continuity results in a characteristic pseudo-paralysis, with curvatures, abnormal twistings, and preternatural mobility of the bones, with loss of power of locomotion. Then the osteophytes increase in size by the formation of several layers, thus enlarging the inferior extremities of the long bones. He describes the general process as consisting, first, of a periosteo-genesis, - a formation of osseous tissue from the periosteum; next of a chondrocalcosis, - a calcareous incrustation of cartilage; and finally of a gelatinous degeneration and softening of the bone, with separation of the diaphysis and epiphysis. Verraguth (Arch.f.Path.Anat.) describes the first step as an excessive formation of vessels in the cartilage and a corresponding overgrowth of the cellular elements. This becomes inflammatory, and constitutes a primary syphilitic chondritis, the changes in the medulla of the bone being degenerative and secondary to the affection of the cartilage. Still other observers have described the process, each with modifications;but it is unnecessary to quote them as they are of no clinical importance. Taylor (Syphilitic Lesions of the Osseous System in Infants and Young Children,1875,p.134) says that in the first stage there is a simple hyperplasia of cells with irregular deposition of lime salts; in the second, an intensification of this condition; and in the third, a new element, namely, the abnormal proliferation of all the elements of the tissues, with an infiltration of granulation tissue into the medullary spaces following the vessels. From all this it would appear that, with the exception of minor points of difference, the observers in question all coincide in describing this condition as one essentially of the nature of syphilitic bone troubles with which we are familiar in the acquired form of the disease, consisting primarily and throughout of an unnatural accumulation of cell-elements, which in the later stages by their pressure produce various degenerations of surrounding structures, and which, as they occur during the process of bone-formation, are accompanied by irregular and abnormal deposition of lime salts. They especially affect the regions mentioned - the junctions of the epiphyses and diaphyses - because at that time those points are the seat of great physiological activity. Syphilis, indeed, throughout its entire course is notably subject to similar influences, as one example of which may be mentioned the preference displayed by the periostitis which results in nodes or in caries for the subcutaneous bones, the tibia, clavicle, cranium, etc.;

or, in other words, for those which are subject to frequent traumatisms - trifling, perhaps, but sufficient to determine a slight hyperaemia, which is followed by abnormal proliferation or accumulation of cells. The child may be attacked during intrauterine life, and in that event the osseous lesions will probably be coincident with other syphilomata and with placental disease of sufficient gravity to destroy life; Pullnow (Sanguinolent Dropsy of the Foetus, Berlin,1874) found osteochondritis in 35 out of 50 syphilitic foetuses. If the child be born alive, the first development of the disease will be noticed probably as a swelling at the diaphyso-epiphysial junction of one of the long bones, which in the emaciated subjects of syphilis is often visible to the naked eye and can always be felt by palpation. The bones most frequently attacked are the humerus, radius and ulna,tibia and femur; but the clavicle, ribs, sternum and bones of the metatarsus and matacarpus are also involved, and much more rarely too frontal and parietal. The more pronounced the syphilis of the parents, or the nearer the date of conception to the time at which their affection occurred, the more probable is it that several bones will be affected, and the less chance will the child have of surviving. Indeed, it has been noticed that in stillborn infants and in those dying soon after birth the majority, or even all, of the long bones are syphilitic. The swelling is found to consist of a ring or collar which more or less completely aurrounds the bone, is apt to be smooth rather than irregular, and when two bones situated near to each other are simultaneously affected may conjoin them. This condition persists during the first stage of the disease, and passes with greater or less rapidity into the second stage, in which the swelling, the cell-proliferation, reaches its height. In cases uninfluenced by treatment this may take several weeks or even months; otherwise rapid improvement is observed. During the second stage, however, owing to the proximity of the swellings to the joints, a moderate amount of synovitis is not infrequently noticed. This affects the elbow and the knee. Deformity often becomes more marked when the third stage, or that of the formation of granulation-tissue with degenerative changes of the cartilages of the bones themselves, is reached. There are unnatural curvatures in the bones, with more or less complete separation at the point of junction. Where many bones are affected in this way, the resulting deformity is extreme and the patient may be absolutely powerless, a condition of pseudoparalysis supervening in which the limbs lie motionless or swing about like arms or legs of a doll when the infant is carried about. In cases in which the swelling does not undergo absorption, the superjacent tissues sometimes become involved, abscesses form and make their appearance externally, extensive necrosis of the shaft of the affected bone takes place, and death is not long in occurring. When the cranial bones are involved, the disease is apt to limit itself chiefly to the stage of osteophytic formation, the immovability of the bones probably favouring the organisation of the new cell-growth rather than the

production of inflammatory changes. The growths are met with chiefly in older children than those affected with the form of osteochondritis above described; they affect the periphery of the liver, and are mostly found around the anterior fontanel, and later up on the parietal and frontal eminences. The oesteophytes vary in thickness from a quarter of an inch to an inch; but they are sometimes even larger than this. The sutures are sometimes complete soldered together; and in a case reported by Barlow (Trans.Path.Soc.,1879,p.339) it was not possible at the autopsy to discover the point of unition. These conditions may all result in a child the subject of acquired syphilis, but are apt to be milder, to involve fewer bones, and to respond better to treatment. This would, of course, be expected, inasmuch as the same difference in favour of the acquired form, as compared with that which is inherited, extends to all lesions. "In the one case," says Diday, "the poison vitiates only the elements of nutrition; in the other it vitiates at the same time those of formation and those of nutrition."

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Other points concerning the pathology of syphilis will receive consideration presently.

S Y M P T O M A T O L O G Y .

PLAN OF NARRATIVE.

For convenience and comprehensiveness of description, I purpose dealing with the symptomatology of syphilis under the two principal headings of General Clinical Course and Analysis of the Symptoms, and with due regard to the distinctive features of the acquired and hereditary forms of the disease in their proper order. This must necessarily include complications and sequelae, ad well as an elaboration of much that has already been considered in the section immediately preceding this.

CLASSIFICATION.

Various schemes of classification of the symptoms of syphilis have from time to time been advanced and deal mainly with the acquired form of the disease. As far back as the sixteenth century we find Ruiz Diaz de Isla (Tractada, etc., en Case de Robertis, Sevilla,1539) maintaining the possibility of dividing the clinical phenomena of syphilis into stages. He recognised three forms, the first being characterised by a general eruption of spots and curable without treatment; the second in which there were treatment-requiring abscesses and ulcers; and the third, a universal infection, which is accompanied by pyrexia, loss of flesh and strength, and excruciating pains.

Somewhat leter, Jean de Vigo (Opera Chirurgiae, Lugduni,1542) classified the symptoms of the affection as then ebserved into two periods, namely, the period of the primary lesion (morbus non confirmatus) and the period of constitutional involvement (morbus confirmatus).

Fernel (op.cit) was not long behind the above in advancing a specially devised classification, in which he recognised several stages. He maintained that the virus of the disease soon after its genital inoculation attacks the surface of the body and gives rise to a hirsute disease; this is his first degree of syphilis. In the second degree the affected skin shows a multitude of spots. But it is in the third degree that syphilis can be said really to commence; for by then the poison has pervaded the entire organism, affections of the bones, muscles, and nerves, accompanied by torturing pains, which now characterise the fourth degree and may kill the marasmic patient at any period thenceforth. The most notable thing about this peculiar classification is that it recognised for the first time a distinction between the superficial and deep cutaneous lesions.

The division od syphilitic symptoms into stages was also attempted by Thierry de Hèry (Curative Treatment of Venereal Diseases, p.133), who says that the "usual symptoms of lesions of this disease are several in number, of which some precede, others follow, others supervene. Those which precede are ulcers of varied nature; the others, or consecutive, produce pustules and incipient ulcers in the whole body. The

last cause fixed pains in the whole head, mostly with exostoses, and the bones frequently became carious."

Ricord (Lectures in Syphilis, Paris, 1856, Ed.2, p.348; Lectures on Chancre, Ed.2, p.198) has divided the clinical plenomena of syphilis into three stages: (1) The stage of the chancre of primary lesion, the immediate consequent of inoculation of the virus; (2) the stage of secondary lesions or of acute general invasion of the virus; and (3) the tertiary stage or the stage of late lesions which seldom are observed before the end of the sixth month after infection.

To these three stages other observers have added a fourth or quaternary or stage of parasyphilitic phenomena.

This classification is entirely an arbitrary one and one merely of clinical convenience; for syphilis is one of affections which refuses to obey any law as to the order of appearance of its lesions, and in its evolution is anything but so orderly and constant as Ricord would suggest. Thus, one of the stages may be absent; long intervals of time may separate the secondary and tertiary stages or they may be almost simultaneous in their occurrence; and the evolution of the affection admits of various other irregularities. The classification, however, is approximately correct, and, bearing in mind its clinical defects, may be used, generally with amendment, for descriptive purposes.

Ricord's classification was severely criticised by Baerensprung, of Berlin, who from a pathological standpoint recognised merely a hyperaemic and a tubercular period, secondary syphilitis menifesting itself first of all by hyperaemias, and the tertiary stage being preeminent for the general production of tubercles.

On the other hand, Virchow (Treatise on Constitutional Syphilis, Paris, 1859) divided the constitutional phenomena of the disease into a passive or negative group of marasmus, cachexia, of irritative phenomena, with various inflammations and new-formations.

GENERAL CLINICAL COURSE.
ACQUIRED SYPHILIS.

PERIODS.

We have seen that the clinical phenomena of syphilis are usually divided into certain stages or period on the lines first laid down by Ricord; and that it is important to remember that all such classifications are in a sense artificial and seldom allowing of sharp limitations, owing to the merging of one period into another quite insensibly and the general protean characters of the disease. Thus qualified, our narrative may take into consideration, first, a stage of primary incubation, which period averages in duration three weeks and includes the time intervening between exposure to contagion and the appearance of the shancre. Second, a primary stage, averaging three to ten days, in which the chancre develops and the anatomically related glands become enlarged. Third, a stage of secondary incubation, comprising the time

elapsing between the appearance of the chancre and the development of the secondary symptoms, and averaging about six weeks, as well as including the period of primary symptoms. Fourth, the stage of secondary symptoms, averaging from twelve to eighteen months and including syphilitic fever, anaemia, neuralgic pains, and the lesions of the skin and mucous membrane developing during this period. Fifth, an intermediate period, lasting according to some authors from two to four years, during which the patient may be entirely free from any signs of syphilis, or may suffer from slighter, more irregular, less symmetrical, and less generalised symptoms than those of the secondary stage. Sixth, a period of tertiary symptoms, characterised by either the formation of gummata or by diffuse infiltration of various organs. Chronic periostitis and ostitis, skin affections of the tuberculo-ulcerous type, disease of the nervous system, etc., are encountered during this stage. Most of the syphilitics properly treated fail to show lesions of this stage; though they may make their appearance at any time subsequent to the initial lesion, they are generally observed in the third and fourth years following the chancre. Lastly, a quaternary stage, which has been devised by writers to include the late nervous and other phenomena appearing many years after the syphilitic attack and very serious in their effects.

TYPES.

The general clinical course of syphilis admits of considerable variation, and certain well-recognised types may be seen. Thus, the malady may commence and terminate with enlargement of the inguinal lymphatic glands after a chancre, no constitutional phenomena being subsequently noticed. In such cases a reasonable suspicion of a faulty diagnosis of the primary lesion may be entertained. Nevertheless, one is sometimes justified in concluding that the infection may be so mild in exceptional cases that it is aborted from its secondary manifestations by the strong resistance of the patient's system; it is also known that after such a sore and the entire absence of secondary symptoms, tertiary troubles may assume a prominence years later. Again, the syphilitic attack may be merely characterised by a chancre, general enlargement of the pymphatic glands, and one light outbreak of macules or papules on the skin and mucous membranes of the mouth and fauces, but no subsequent troubles. But more often there is after the chancre a single outbreak of skin trouble, disappearing quickly under treatment, but recurring occasionally, particularly in the mouth and throat. These recurrences yield promptly to more energetic specific medication, and are not followed by tertiary symptoms. The types of the disease just described are called benign; but the most serious and intractable tertiary troubles may after them be observed. In exceptional cases syphilis is on an atypical evolution, there appearing in the secondary stage deep ulcerating and infiltrating lesions; this is sometimes characterised by a malignity of its manifestations. Malignant syphilis is characterised by its acute course.

Even the chancre exhibits a destructive tendency, resembling in its development phagedenic chancroid. Syphilitic fever, concomitant rheumatism, and anaemia are well marked. The first eruption quickly becomes pustular, and ulcers form which are deep enough to leave pigmented scars on the skin, and in the mouth and nose to involve the superficial bones and cartilages, causing necrosis and deformity. Deep ulcers and ulcerating gummata appearing in the secondary period are especially charachteristic of this form of syphilis. Recurrences following close upon one another are also typical of malignant syphilis, while early involvement of the bones, the nervous system, and the viscera are by no means rarely seen. It is quite common for marasmus and death to carry off these patients at an early stage; they are usually anaemic, alcoholic, scrofulous, tuberculous, lamarial, pregnant, or nursing individuals, and in them the affection seems to have its malignity dependent not so much on the virulence of the infection as upon the lessened tissue resistance obtaining.

STAGE OF INCUBATION.

In the vast majority of cases of an uncomplicated sort, there is, after inoculation with the specific poison, a period during which there are no symptoms of any kind, either locally or generally; and to this symptomless interval the name of PRIMARY INCUBATION PERIOD has been applied. It is metaphorically the calm which precedes the storm, and is exactly similar to the period of incubation which is observed in other infectious diseases - in the acute exanthemata, for example. No one now denies the existence of this incubation period; in former times, however, the contrary obtained, and until the actuality of the circumstance was established by Cazenave (Treatise on Syphilis,Paris,1843), who affirmed that "syphilis is a general disease from its commencement, which dates from the very moment at which the infecting contact occurs, as in all diseases which are virulent, and consequently general. The primary symptom is not the first mode of action of syphilis, but really only the first phenomenal expression of the infection, and when it manifests itself the disease has already commenced." Amongst the first supporters of this theory were Chausit (Annals of Skin Diseases in Syphilitis,T.iv,p.177) and Vidal (Treatise on Venereal Diseases,Paris,1855,p.196), and their example was speedily followed by others who found a ready clinical and experimental proof. Both on men and animals experiments were conducted under conditions of inoculation, with the result that it was universally recognised that the reaction of the system under the inoculated poison is deferred for a time of variable duration; a host of clinical facts, less reliable of course, have verified this observation. Numerous observers have given their attention to the determination of the duration of this stage, the desirability of this lying in the fact that determination of the length of the incubation period will enable the medical attendant to state when his patient can be said to have syphilis. In the laboratory and at the bedside workers in this field have been as numerous as enthusiastic. Clinical

observation is admittedly not so reliable as experimental observation, as the date of sexual intercourse is not necessarily that of inoculation, as the specific microorganism may remain on the genitals and not enter the lymphatics for a time. Nevertheless such an occurrence is exceptional and does not materially affect conclusions. This period has been found to last about three weeks, sometimes twenty-five days, sometimes longer or shorter than that, with a range of from fourteen to forty-two days. It has been said that the average duration of the incubation period is twenty-seven days in cases of infection from secondary lesions, and less than that in cases of inoculation from chancres. Hutchinson (op.cit.) says that the primary incubation period is seldom less than five weeks; and others that it is twenty-five days, in a few cases forty days, and in none less than fourteen, cases in which it is more than six weeks being uncommon and those covering less than fourteen days questionable. A period of twenty-five days has been established as the average duration in experimental cases. There are certain facts upon which this variation in the period of incubation depends, such as the dose and virulence of the poison, the idiosyncrasy of the patient and the state of his health at the time of infection, and the channel of introduction of the specific germ. Although this period is devoid of symptoms, as in the case of the acute exanthemata there may be a condition of ailing in patients who are suffering from worry or who are out of sorts, such as headache and backache which are of no nosological importance.

PRIMARY STAGE.

This stage includes the changes that occur during the time which elapses from the appearance of the chancre to the manifestations of the constitutional troubles. The first sign of infection is in the form of a sore at the exact point where infection took place, which is termed the hard chancre, initial sclerosis, or the initial or primary lesion of syphilis. While the first lesion of syphilis is always circumscribed and definite in its site, it is not true that the virus is entirely localised within it, for its extirpation does not abort or in any way modify the course of the disease - from which it follows that at least partial invasion of the system has taken place before its appearance. The term PERIOD OF SECONDARY INCUBATION has been used to cover the time elapsing between the appearance of the chancre and the development of the secondary symptoms, characterised by the chancre and the adenopathy and a slow and natural tendency to resolution. During this period the patient may retain full vigour and appearance of health, or there may be prodromal symptoms, such as malaise, hebetude, headache, slight muscular pains, and occasionally a low or high temperature, showing that the system is slowly being brought under the influence of the poison. Then follows the first eruption, with the appearance of which the establishment of syphilis within the system may be said to be effected. The local lesion or hard chancre occurs at the end of the incubation period at the exact point

where inoculation took place during the infecting contact; it is generally single, while the enlargement of the lymphatic glands is multiple. It is usually readily perceptible, though when concealed situations its presence may never be suspected until the appearance of the constitutional symptoms. In women especially, it is apt to escape attention; in some cases it is so small that it is not noticed for some time, and, even when noticed, the patient may either not understand or recognise its inimical importance. The presence of such other local troubles as gonorrhoea obscuring its location, and the very fact that it is in a private part, may cause it also to be overlooked. Even when not discovered, the presence of local adenopathy should give a clue to its existence or pre-existence. The initial sclerosis or hard chancre is generally to be found on the genitals; but it is as well to bear in mind that it may occur in other parts, - in fact anywhere, - and that its appearance depends upon its site, the presence or absence of irritation, and the concomitance of other lesions. At the point of inoculation with the specific poison one observes a circumscribed redness, which rapidly resolves itself into a new growth of small, though variable, dimensions. The neoplasm in question commences as a small flat papule, which slowly increases in size, and may become dry or eroded or result in ulceration. In every instance the induration is sharply defined, circumscribed, and presents the striking peculiarity that it varies in intensity and cause the impression that it is hard as cartilage or it is so small as to be scarcely palpable. The age of the lesion and the amount of irritation are the factors which govern the degree of induration. The lesion terminates by resolution, commencing in the sixth week, when the edges collapse and cicatrisation begins. The cicatrix or depression which follows the chancre is more or less permanent, depressed, rounded, and sometimes pigmented. If its location has been superficial, there is no scar-relic to be found. It lasts a variable time, usually from four to six weeks, and in a few cases has been known to persist for several months. It is seldom that we observe more than one chancre. Papagny (cited by Keys, - Syphilis) has studied fourteen thousand cases, and found that in from 25 to 33 per cent. the chancres were multiple, from which it follows that it is quite erroneous to adduce uniqueness as a characteristic feature. When multiple, the number is usually two; but cases in which several more have occurred have been from time to time observed, particularly in the breasts of nursing women. Multiple chancres are usually found in the same stage of development; but this is not necessarily the case, as they are autoinoculable and successive chancres may develop for some time after the appearance of the first - from which we may take it that some time is required for the establishment of systemic immunity. The commonest sites for extragenital chancres is the lip, though they have been observed also on the nose, eyes, fingers, ears, in the mouth, and about the anus and inner aspect of the thigh. Indeed, they may be seen on any part of the skin where it is possible to effect inoculation. The

Russians are said to show extragenital chancres more often than any other nation. The enlargement of the anatomically related lymphatic glands following the appearance of the chancre lasts from one to two weeks; it is due to invasion of the system by the poison, not to local inflammation, and is the usual, if not the invariable, concomitant of the initial sclerosis. The lesion affects the group of glands nearest the chancre, and is confined to one group of glands unless there is crossing of the lymphatics, as in the case of the groin glands, when both sets are enlarged. The adenopathy is indolent, and unaccompanied by pain, suppuration or any signs of inflammation in the gland itself or in the adjacent tissues. One gland first slowly enlarges, and is soon followed by the other glands in its group. The first to enlarge generally remains larger than the others, and is seldom larger than a marble. The affected glands remain distinct from one another and the enlargement is characterised by the absence of adenitis. The induration of the glands is an important diagnostic feature; the outline presented to the examining finger is round or oval, and resistance is well marked. Being distinct and non-adherent, the glands can be freely moved underneath the skin, upon the underlying parts and upon each other. Secondary infection by pyogenic microorganisms may lead to inflammation of the glands; then there will be the usual cardinal symptoms of the inflammatory condition with suppuration as the result; earlier writers regarded pus so originating as non-incurable. The tenacity of the glandular induration is a characteristic feature of the trouble; it generally outlasts the chancre and sometimes is appreciable for years. From the diagnostic standpoint, especially in doubtful cases, this is of great importance. Though the usual termination is in resolution it is doubtful whether the glands regain their normal functions or not. The hard chancre may have a coincident chancroid; and in this case there is a mixed bubo with the chancroidal lesion overshadowing the other. The usual appearances of inflammation are observed, suppuration speedily occurs, and the syphilitic induration makes its appearance later on. Syphilitic lymphangitis is observed in the lymphatic vessels which connect the chancre to the enlarged glands. This affection is characterised by the formation of small, hard, indolent, knotty cords. The course pursued is slow, and, if purely syphilitic, resolution will ultimately occur. In addition to such trivial symptoms as headache, lassitude, and the like, the blood may show signs of anaemia in males or of chlorosis in females.

SECONDARY STAGE.

Cases of syphilis that are properly treated from the outset may never show signs of this stage; but in those who have been neglected therapeutically or who do not respond to treatment, secondary symptoms generally develop within eight weeks after the appearance of the chancre. The term SECONDARY INCUBATION PERIOD has been applied to the time intervening between the appearance of the chancre and the outbreak of the secondary phenomena. This stage is very indefinite in its course. It is said to begin at about the twelfth to

the eighteenth months, though it is almost impossible in certain cases to give any opinion. It may never occur, may be transient, or may be prolonged. As a rule, three years will suffice for the development of the secondary symptoms, but they may be seen for as long as fifteen years after the primary lesion. There is sometimes no constancy about the stage, which may vary from a mild attack, which escapes observation, to a severe condition affecting the entire system of the patient. It is made to include the febrile phenomena, the skin eruptions occurring in the course of the disease, the loss of hair, affections of the nails, vagina, mucous patches within the mouth and elsewhere on the mucous surfaces, and the like. There is a toxaemia and a local hyperaemia of varying intensity, the lesions, however, stopping short of tissue-destruction and tending to spontaneous resolution. During the secondary incubation period the patient may seem in his usual health, or more frequently he suffers from headache and lassitude towards the end. The patient's condition of chronic worry regarding his condition may cause him to lose weight and to develop a pallor of countenance. In rare instances there is a distinct and abrupt line of demarcation between the primary and the secondary symptoms. The lesions are eminently infectious in this stage. The toxaemia is the result of poisoning of the system by the specific virus, and this finds expression in hyperthermia. This fever may be preceded by such prodromal symptoms as emaciation and anorexia, insomnia and headache. Not all cases, however, are febrile, but those that are show a rise of temperature of a remittent or a continuous type, though some have only a single temporary pyrexial elevation. Women more often than men are feverish, the pyrexia, as a rule, preceding the outbreak or the skin eruptions and sometimes being absent altogether. There may also be generalised pains and increase of pulse and respirations. Syphilitic toxaemia is, however, so rare that it is not always recognised, being not infrequently diagnosed as malaria, typhoid, rheumatic fever, and so forth. But the development of the skin eruptions usually settles the difficulty, though sometimes the secutaneous affections simulate one of the acute fevers and make the diagnosis even more difficult than before. The pains, the fever, and the other lesions are peculiar in being worse towards nightfall. This stage is eminently characterised by the number and variety of its cutaneous manifestations, the nature and severity of which are modified by the virulence and dose of the poison, the idiosyncrasy of the patient, and the previous treatment or absence thereof. Secondary syphilides are of progressive development and of slow evolution especially in the later stages; they are polymorphous or exhibit variation of form at certain points, and papules, macules and crusts may be found at the same time. The absence of pain, irritation, and inflammatory reaction is noteworthy and characteristic, and the same is true regarding the more or less coppery colour which they assume. The shape is that of a circle or the segment of a circle, and a diagnostic point is their symmetrical arrangement consequent on the even distribution of the virus in the blood-stream. When

ulceration occurs, the ulcer is round or oval, abrupt in its edges, and possessed of a dirty base. They usually terminate in resolution, and, as the lesions are superficial and benign, scar formation is not usually observed. Relapses sometimes occur, and in each one the developing syphilides approach more and more the tertiary type.

TERTIARY STAGE.

As its name implies, this stage follows the secondary one; it is even more definite in its course. It is held to begin at about the first year and to continue until the termination of the disease, though, as already stated, some have added a QUATERNARY STAGE to it for the purpose of special designation of intractable or tardy nervous or other lesions. Belonging to it are certain skin eruptions, especially that which goes by the name of rupia, and gummata, as well as various affections of the bones, such as nodes and chronic enlargements of the lymphatic glands. From the presence of gummata in the placenta, or from the attack of the specific poison on the ovule, pregnant patients are particularly apt to abort or miscarry at this period. In its constitutional manifestations the severity of the disease in this stage is sometimes very destructive. It is in the tertiary period a constitutional affection in the sense in which Hunter used the term, that is to say, a malady in which all parts of the body may become affected in one and the same way, it pursuing its malevolent course beyond the skin and mucous membranes to every part of the body where connective tissue exists. The transient, superficial lesions of the preceding stage are now succeeded by lesions of a profound character, which affect the viscera as much as the skin. The changes are not the simple hyperaemias of the secondary period, but destructive lesions of a malignant character. These occur insidiously, are of slow evolution, chronic in duration, and diffuse or circumscribed in character. There is no accompanying febrile disturbance, and ulceration is frequent. The surrounding tissues are invaded and destroyed, and there is no tendency to spontaneous resolution on the part of the lesions. The latter are deep, destructive and malignant, few in number, not infrequently single, generally asymmetrical and monomorphous, and distributed in circles or segments of circles. They are more circumscribed than secondary lesions, and their contagiosity has not been established. Histological the lesion is either an interstitial sclerosis or a gumma. The skin is the seat of a few eruptions of a gummatous nature. The simple gummatous syphilide consists of nodules of a dark colour and of slow evolution; it may be discrete or confluent, and the spreading margin is of a serpiginous character. After healing a cicatrix remains. The ulcerative gummatous syphilide is a chronic and painless condition, unaccompanied by inflammatory reaction or glandular enlargement. It often passes unnoticed until it has done irreparable mischief. The cicatrix which occurs after healing is depressed, white, and more or less circular, and may cause hideous deformities when situated on the face. This syphilide may occur as an ecthyma or a

rupia. In the former a thick brownish-green crust forms; this crust is adherent to the punched-out ulcer and leaves a rounded, depressed scar. In rupia, - a rare condition, - the crusts are in the well-known limpet-shell arrangement, and surrounded by an areola. It occurs in neglected or debilitated individuals. Other tertiary manifestations are cutaneous and sub-cutaneous gummata; they develop as nodules of varying size and ultimately break down, leaving a characteristic gummatous ulceration, the ulcers having a circular outline, an excavated appearance, sharply-defined and deep borders, adherent, - but not undermined, - edges, and a base covered with a caseous mass. They may be single or multiple, and occur most often on the lower limbs. Spontaneous resolution is rare, and cicatrices, which are permanent and depressed and not infrequently pigmented, occur after healing. The characteristic lesion of tertiary syphilis is the gumma, which is circumscribed or diffuse, and may affect any part of the body. Ulceration often occurs. In the internal organs the gumma has not the outlet that it has in the skin, and inflammatory exudation becomes scar tissue which envelopes the gummy mass. Healing takes place by encapsulation or absorption of the tumour, and the resulting scar is characteristic. The symptoms occasioned by these granulomata depend on the organ affected. The arterial changes which occur in all stages of syphilis reach their highest expression in this period. It is impossible to state with absolute accuracy when the tertiary period begins and how long it lasts. Tertiary symptoms may occur at any time after the disappearance of the chancre, but they rarely appear until the first outbreak of secondary symptoms has spent itself. They most commonly make their appearance in the second and third years of the disease, but are by no means uncommon in the first year. In the majority of cases they occur within three to seven years, but they may be delayed for twenty years. The duration is indefinite, and relapses are not infrequently observed. Alcoholism has an unfavourable influence in the determination of the tertiary phenomena.

It is in dealing with the tertiary stage of syphilis especially that one rebels at the time-honoured and arbitrary restriction of the disease in periods, the changes being continuous from the moment of infection, when the virus enters the system at the site of where later the chancre appears, until the last manifestation disappears. Thus it is that strict periods are not advantageous; and the term tertiary stage merely indicates the latest manifestations of the disease, although, as stated, a quaternary stage may be added if so desired. The errors of such artificial classifications as those already described, and particularly Ricord's, are becoming more and more apparent every day, and it may be that in time such symptomatological arrangements will be entirely discarded from the respected position they have so long occupied. The chief fallacy lies in the fact that an endeavour is made to make syphilis conform to a time schedule and to a regular, unvarying succession of changes. Such a course syphilis does not

pursue, and any attempt to make it appear that it does is misleading in the extreme. The tertiary stage in many cases never makes its appearance, all symptoms of the disease ending with the termination of the cutaneous symptoms. Moreover, the secondary stage, so far as its chief symptoms are concerned, may be entirely wanting, and the so-called tertiary phenomena follow close upon the appearance of the chancre. The only stage in which the symptoms are possessed of sufficient constancy and definiteness to warrant their being classified as belonging to one period of the affection is the primary. It is only possible to obtain an intelligent conception of syphilis, as it occurs in actual practice at least, by regarding it as a disease not following any one definite course, and manifesting itself in a series of symptoms appearing at a certain time after the development of the chancre, these running their course within specified and exact limits, then to disappear and be succeeded by another set of symptoms equally concise and clear; but as an affection that, starting from a given point, pursues many different lines of evolution, and expresses itself in a great variety of symptoms. Very often, indeed, it expends its entire energy in an attack on one organ or set of organs. Thus, the symptoms may be confined entirely or in a large part to the skin, to the bones, or to the nervous system, or to any one of the various organs or system of organs of which the body is composed; or a number of organs may be attacked simultaneously or in succession. Again, in its encroachment upon a given organ, it is not by any means uniform in the lesions that it produces or in the effects to which it gives rise. There is no lesion of the skin that syphilis may not reproduce, and its development in the deeper structures furnishes a list nearly as extensive as a list of anatomical alterations. It follows, then, that the study of the symptoms presented by syphilis must be one that involves a consideration of its definite lesions, and the effects which they have upon the different organs. Furthermore, it must always be remembered that it is invariably a constitutional disease. The involvement of the system may be very severe, or it may be so slight as to give rise to scarcely any appreciable symptoms. Limitation of all symptoms to the chancre means that the systemic manifestations have been mild and the skin troubles overlooked, or that the nature of the local lesion presented was misunderstood. In its clinical course syphilis is a chronic disease, persisting usually for a long period of time, and seldom presenting any symptoms that can be classified as acute. Under favourable and early treatment most cases recover in from two to four years. Some cases are so mild that all symptoms vanish after the expiration of a few months, and never reappear. This happens sometimes with no treatment at all, or a treatment of a most indifferent nature. In other cases the symptoms are severe from the beginning. Bone and brain lesions appear with, or precede, the skin lesions. The skin may be quickly invaded with ulcerating gummata instead of the more frequent macules or papules. The integrity of every organ in the body may be threatened,

and a fatal ending may occur. This malignant form of the disease is called by certain authors malignant, galloping, or lightning syphilis, and the terms are apt and appropriate. Besides being of very rapid course, it resists all forms of treatment; the various stages make their appearance early, especially the tertiary which may be seen as soon as six weeks after the infecting contact; and the patient dies in a condition of extreme marasmus.

HEREDITARY SYPHILIS.

Like the acquired disease, hereditary syphilis is characterised by the number and variety of its manifestations, a fact which makes an exhaustive and methodical description correspondingly difficult. The affection is acquired in utero, and is the expression of severe infection of the foetus occasioned by recent syphilis of one or both parents. The gravity of syphilitic manifestations in the foetus is due to specific changes in the viscera. As opposed to the acquired disease, the typical lesions of early hereditary syphilis is found in a diffuse cell-proliferation originating in the perivascular connective tissue of the smallest blood-vessels; and for this reason one rarely sees a solitary syphiloma in the infant. In the adult, syphilis localises itself here and there in small areas, and shows a special affinity for the skin and mucous membranes and later for the nervous system; but in the foetus the chief localisations are in the viscera, and secondarily in the bones. The diffuse nature of the lesion contrasts strikingly with the circumscribed visceral involvement in the case of the adult. Hereditary syphilis gives rise to more constitutional disturbance, the acute symptoms run a more rapid course, and the disease is more often fatal than in the acquired variety; the changes occur in actively growing bones more frequently and affect more bones, and the skeletal changes are more often permanent. Clinically, there are two varieties of hereditary syphilis - the early and the late, each of which may now be separately described.

(A) EARLY HEREDITARY SYPHILIS.

The majority of cases of hereditary syphilis show signs of the disease in early life, symptoms, as a rule, occurring within the first month after birth. Early hereditary syphilis bears the same relation to late hereditary syphilis as secondary acquired syphilis does to the tertiary symptoms of the acquired disease. The symptoms are usually severe from the first. The infant is emaciated, this wasting being characteristic and commencing a few days after birth. In severe cases the emaciation is so severe that the skin becomes loose and wrinkled, and the child has an aged appearance; in cases in which an emaciated child's weight is not regained in a month, syphilis should be suspected. The infant snuffles and cries hoarsely. An eruption of bullae appears, situated principally on the palms, soles, wrists, and ankles, and often confined to the extremities.

These bullae are filled, - or, rather, partly filled, - with a semipurulent fluid. On the palms and soles particularly, they burst and leave angry-looking sores, which remind one somewhat, by their situation and general appearance, of the palmer and plantar syphilides of adult syphilis. The cachectic look and general feebleness of these children show them to be profoundly affected. The lips are cracked and ulcerated, and crusts form at the corners of the mouth and nasal apertures. The liver and spleen are manifestly enlarged, and the imperfectly-performed digestion, as shown by the continued loss of flesh and unhealthy stools, would seem to indicate that other abdominal viscera are also involved. These cases usually prove fatal in a few days or weeks, not infrequently in a few hours. But it must be noted that all cases do not show the disease at birth in this way. The symptoms are not invariably so marked, nor do all the patients die so soon. Still, a very large proportion of syphilitic children living at birth appear unaffected, and present perhaps all the appearances of health. Nevertheless, though most of these children are born apparently healthy, presenting no symptom by which the experienced observer can detect the disease, some of them, without showing signs of syphilitis, give one the impression that they are not perfectly healthy. The affection almost invariably shows itself within the first three months, and usually within the first two. Out of 400 cases, Kassowitz found that the disease manifested itself in the first month in 53 per cent., in the second month in 32 per cent., and in the third month in the remaining 32 per cent. Out of 53 cases, Dunn (Brit.Med.Jour.,1865,ii., 600) found that 17 cases first manifested the disease in the first month, 21 in the second month, 10 in the third month, 2 in the fourth month, 1 in the fifth month, and one in the sixth month. Miller (Jahr.f. Kinderh.,xxii.,H.4,S.359; Viertelj.f.Derm.,N.S.,1888, H.4,S.649) in a collection of 1000 cases found the first appearance of symptoms in the first month in 64 per cent., and in the second month in 22 per cent. In 24 per cent. the first symptoms occurred when the children were three weeks old. It sometimes happens that the outbreak is determined by a febrile disease, such as one of the exanthemata. Thus, the eruption of measles may fade and leave the syphilitic rash in its place. One of the earliest symptoms, which does not always for obvious reasons attract the attention of the medical attendant, but is seldom absent, is obstinate wakefulness at night. Smith (Wasting Diseases of Children) says that the child when put to bed is uneasy and wakeful; he cries almost unceasingly, and cannot be pacified. During the day he is more quiet, but every night there is a repetition of the same disturbance, and his uncontrollable complaints are a source of worry and anxiety to his attendants. The crying is possible excited by the nocturnal pains in his bones, similar to those affecting adults. The sleeplessness often continues after the appearance of other symptoms, but it usually subsides soon after the administration of the usual specific medication. This nocturnal

insomnia may be observed to date from the day of birth. The majority of syphilitic children suffer from snuffles or nasal catarrh, which gives rise to a strikingly characteristic symptom. It appears early, often, if not always, preceding the eruption. It shows itself at the beginning by difficult and noisy respiration. The mucous membrane of the nose becomes swollen and partially closes the nasal passages. A nasal discharge appears and increases, still further occludes the passiage, and acts as a valve with each respiration, which becomes noisy in the extreme. The word "snuffles" in is general use to designate this condition. The discharge from the nose is seropurulent in character at first, and often streaked with blood. In severe cases this discharge runs down over the upper lip, which becomes reddened and excoriated. The difficulty of respiration increases; the discharge becomes purulent and dries into crusts, which may entirely close the nostrils and oblige the child to breathe through the mouth. In such cases nursing becomes difficult and often impossible; the infant, obliged to relinquish the breast every moment to get breath, is fed very imperfectly, and sometimes weans itself. The nasal symptoms may be very persistent, continuing months after other symptoms have disappeared. In some cases the snuffling is not very noticeable as long as the child lies quiet and breathes through the mouth, but the difficulty becomes at once apparent if he is disturbed, and even more marked when he takes the breast. He is then obliged to breathe through the nose, and each respiration is accompanied by a snuffling sound. The discharge itself is due to mucous patches in the lining membrane of the nose. Usually the inflammation in the nasal fossae involves only the mucous membrane, and is rarely propagated to the periosteum, the cartilages, and the bones. In the severest cases the ulceration may, after a time, perforate the septum nasi or lay bare the nasal bones, which become necrosed in consequence of the exposure. Fragments of these bones are sometimes discovered in the exfoliated crusts. In some cases there follows a depression at the root of the nose. According to Trousseau (Clinical Medicine), this deformity is very common. There is, however, a deformity, - either a lack of development in the nasal bones or a preternatural widening, - which is common in syphilitic infants; but it is not certain that it is not a congenital deformity rather than a result of the local disease which causes snuffles. Absolute destruction of the bony framework of the nose at this stage must be of rare occurrence. Coryza may be the only symptom of syphilis in the infant, though its occurrence without other signs of the disease must be far from common. The possibility that it may occur alone makes the diagnosis difficult sometimes. Syphilitic snuffles may be confounded with a simple cold, - an exceedingly common error with the child's parents, - or with nasal discharge from diphtheria, perhaps with nasal or retropharyngeal polypi. Somple coryza is extremely frequent, even at an early age. The discharge is less sticky and less inclined to form concretions than that of syphilis. At the end of eight or ten days it tends

to disappear, while that of syphilis, if left untreated, persists and increases. The nasal discharge of diphtheria might be difficult to distinguish if diphtheritic patches did not exist in the throat. The diphtheritic discharge, which presents nothing peculiar at first, after twenty-four to forty-eight hours is streaked with blood; and the nasal mucous membrane may be covered with false membrane. In severe cases of hereditary syphilis the cry of the infant is most noticeable, it being both hoarse and high-pitched. Its peculiarity is due, without doubt, to the existence in the vocal cords of lesions similar to those that give rise to snuffles. In most cases the symptoms above described are but the forerunners of the skin troubles. The external integument of the body presents a series of eruptions which closely resemble those of scquired syphilis, but are modified by the character of the infant's skin and by the manner of its life. The nates and those portions of the body about the pelvis which are moistened and smeared over many times a day are particularly liable to be the seat of eruptions, or a general eruption will flourish and take on more marked characteristics in that region. As already mentioned, the eruption of bullae occurs about the hands and feet in cases of unusual gravity. In cases in which the eruption is delayed until a later period, the usual eruption is an erythema, which consists of round or roundish pink spots which disappear on pressure at first. Soon the spots grow darker, assume the dull-red coppery hue, and no longer disappear on pressure. Not infrequently a papular syphilide may be the first manifestation of the skin. The syphilides, as the eruptions of syphilis are called, will later on receive full consideration. The skin hangs in folds on those cachectic subjects in whom emaciation is marked; but wasting is not a prominent symptom in many of these cases. The skin has a pale, sallow, yellowish, or earthy hue which is often said to be characteristic; but diagnosis from the appearance of the skin alone is not easy to effect. The manifestations of syphilis on the lip and buccal mucous membranes are of prime importance. On the lips fissures, known as rhagades, are exceedlingly frequent. Their number and depth are very variable. On the upper lip they occur especially on either side of the median lobule, where they are manifestly an exaggeration of an anatomical disposition. On the lower lip the fissure is often a single one in the median line. In addition, the whole surface of the lips may be covered with ulcerations and excoriations. At the angles of the mouth also, flat papules on the mucocutaneous portions, condylomata, and ulcerations occur, which may be covered with crusts or be superficially or deeply ulcerated. A peculiar appearance is occasionally imparted to the mouth by mucocutaneous ulcerations at the commissures, which look as though the mouth had been lengthened by a slit at the angles. There may be more or less ulceration of the tongue, gums and fauces also. At first the manifestations of disease in the mouth consist of slightly-elevated, well-defined portions of mucous membrane with

whitish surfaces, like the corresponding manifestations in the adult. The white epithelium is often cast off, leaving a smooth, often depressed surface, which may ulcerate. In the severer cases these patches lose their regular outline, coalesce, and form very extensive ulcerated surfaces. There is an abundant and highly infectious secretion from these ulcerations. It is the source of inoculation in most of the very frequent cases in which hereditarily syphilitic infants propagate the disease. Enlargement of the glands seems to be a less marked characteristic of hereditary syphilis than of acquired. Lymphatic ganglions are said by Parrot to be less developed and less sensitive in very young children than they are a little later. When they are enlarged in infantile syphilis he thinks it is consecutive to cutaneous lesions, though one sometimes feels the cervical glands when no cutaneous lesions are present to account for them. In order of frequency they are the inguinal, axillary, and cervico-maxillary. Their characteristics are the same as in the adult form of syphilis; they are multiple, non-inflammatory, perfectly distinct and movable in their cellular surroundings. They are seldom recognised by the touch, though occasionally they project sufficiently to be noticeable to sight. It is evident that the general enlargement of the glands is of much less diagnostic importance here than in acquired syphilis. Hutchinson, at the autopsy of a child of five months, found infiltration of the bronchial glands and a considerable adenopathy of the lymph nodes of the omentum and mesentery. The same loss of hair occurs in the inherited as in the acquired form. It may happen from the occurrence in the scalp of dermal lesions; but there is an alopecia due probably to the adynamic influence of syphilis, which is more or less severe in different cases. Thus, a syphilitic child born after several other healthy ones may be the only bald head in the family, as compared with the luxuriance of the locks of the others. It may happen that the eyebrows and eyelashes are shed. Barlow (Alopecia in Congenital Syphilis) says that he has seen several syphilitic children in whom alopecia has occurred. In some of them, all he could say was that in a given patch the hair was very much thinned, in others the loss of hair was as marked as in alopecia areata. He thinks that in many cases which he has seen the loss of hair was preceded by desquamation, - sometimes very slight, - of the scalp in the region which subsequently became bare. In his opinion, the eyebrows are the most extensive spots. "If in a child from two to three months old one or both eyebrows be bare, it ought always to raise the suspicion of congenital syphilis. The occipital region has in some cases been affected, and with it there has been a moderate enlargement of the occipital glands." But one must bear in mind that in rickety children with much head-sweating and muscular weakness the occiput very frequently becomes bare of hair; and that in a young infant the hair presents a deep bay where the hair is deficient in each fronto-temporal region; also that unless the alopecia is very marked on one side, it can scarcely be regarded as characteristic

of hereditary syphilis. In this disease, and more frequently than in adult syphilis, the nails are involved. The affection occurs in two forms. In the first form a papule or pustule occurs on the skin at the side of the nail. It ulcerates and reaches and extends along the side of the nail. The thick and everted edges of the ulcer, its sloughy base, and the sanious discharge are more or less characteristic, and are accompanied by a general and painful enlargement of the distal phalanx. The second form of onychia is a later manifestation. It begins as a swelling at the base or side of the nail, which becomes thickened, fissured, and brittle, with more or less deformity of the finger. Syphilis sometimes occasions more or less marked retardation in dentition. Under its influence the infant cuts its teeth only in the tenth, twelfth, fourteenth, or fifteenth month, and sometimes even later. This retardation in dental evolution when it occurs is usually general, that is, it involves equally the whole dental system. It may, however, localise itself upon a single group of teeth, as, for instance, the incisors. A like retardation may affect the appearance of the permanent teeth. The primary teeth are especially prone to premature decay. The teeth of the second dentition undergo most important changes, and are believed to present deformities which are pathognomonic and which will be mentioned later. An abnormal early appearance of teeth is frequently associated with signs of syphilis, and is followed by early decay. Unfortunately, the changes in the deciduous teeth are not sufficiently characteristic to be of diagnostic value. The ocular lesions of hereditary syphilis in its early stage consists of iritis and choroiditis. The former affection is much less common than in the later stages, and is usually slight. In the latter condition examination by means of the opthalmoscope reveals small spots of exudation and alteration in the outline of the vessels. Hutchinson (loc. cit.) says that he has studied 23 cases of iritis in syphilitic infants. The average age at the commencement of the iritis was five and a half months. The oldest was sixteen months at the time of the outbreak, the youngest six weeks. Both eyes were attacked in 11 cases. In 15 cases the effusion of lymph may be said to have been copious. The cornea was implicated in a few cases. In 7 cases the cure was complete. In 12 cases the pupil was permanently occluded. Iritis is considered one of the rarest symptoms of early hereditary syphilis, though Hutchinson thinks that it often escapes notice on account of the very slight symptoms which usually attend it. Infants suffering from iritis almost always show some of the well-recognised symptoms of the hereditary taint. The blindness which results from neglect of treatment can be easily averted by mercurial medication. Not a few syphilitic infants suffer from digestive troubles, in the production of which the liver, the spleen, the pancreas, and perhaps even the stomach and intestines play a part. The symptoms begin in an insidious manner, differing not at all from symptoms observed in non-syphilitic children, namely,

regurgitation, vomiting, and diarrhoea. The symptoms persist in spite of treatment, change of nurses, and the most careful hygienic and dietetic care. The child emaciates rapidly, until fat and muscles seem entirely absorbed. In others a mild diarrhoea will persist, although the child is doing in other respects perfectly well. It is probable that erythematous changes similar to those in the mouth and pharynx exist lower down in the digestive tract to account for some of these symptoms: actual structural changes have been found. Förster (Würtzb.med.Zeit.,Vol.iv.,Part i.,1863) has described a fibroid degeneration of Peyer's patches in a syphilitic infant who died six weeks after birth; and others have reported similar findings. In 1883, Bumstead and Taylor (loc. cit.) reported 16 cases of the somewhat rare affection known as syphilis haemorrhagica neonatorum, 2 of them being their own and the rest compilation from the literature. Clinically the haemorrhages vary in extent and severity. In some cases there is merely a limited subcutaneous effusion, in others the haemorrhage takes place into the substance of, or on the surface of, mucous membranes. Some of the fatal cases of umbilical haemorrhage belong to this category. As the haemorrhages occur only in very young children, - seldom later than the first month, - it is often difficult to be certain of their cause. Uracek (Deut.med.Zeit.,1886,No.82) has reported a series of peculiar haemorrhages in different internal organs. Out of 132 deaths among infants of syphilitic mothers, slight haemorrhages were distinguished in 42 cases. There were only 19 cases, however, in which the positive diagnosis of syphilis could be made. Of these children, 18 were born alive, but none lived very long, 10 surviving only fifteen minutes. Jones (Brit.Med.Jour.,Nov.12,1887) has reported an interesting case which illustrates the difficulty of a positive diagnosis. It occurred in a family in which the father was known to be syphilitic, and in which other children had died in infancy, the last one from syphilis. He was called to see the child in question, - a male, - on the fourth day after birth, as the child had bled slightly from the unbilicus. There were several large, unmistakeably purpuric spots over the chest, abdomen and axillae. There had been some bleeding from the nose, and the nurse had observed a little blood on the napkins that morning. In spite of treatment, the child continued to grow worse. Fresh purpuric spots appeared, and the epistaxis and malaena increased in severity. The urine on a few occasions was bloody. The child died on the eleventh day. Syphilis was the only assignable cause of the condition. The liver is often found affected in foetal syphilis, and the usual change is an interstitial hepatitis. The organ is enlarged, hard, inelastic, rounded in its outline, and heavier than normal. It resists the cutting knife and presents a pale-yellow appearance on section. Jaundice and ascites do not occur as a result of this inflammatory condition. Enlargement of the spleen is common, and it occurs early; few cases lack it. The other organs implicated in hereditary syphilis are the lungs and kidneys. The former is not infrequently

the seat of any gross lesion, but the so-called white pneumonia and gummata are said to occur. The kidneys not uncommonly show a diffuse infiltration. The visceral lesions found after death have not always caused symptoms during life to raise a suspicion of their presence. The nervous system is subject to the same changes that occur in adult syphilis. The chronic meningitis which occurs may be accompanied by hydrocephalus, which rarely causes the enlargement of the head found in non-syphilitic condition. Severe nervous symptoms of an eclamptic nature sometimes occur; Finkelstein (Pfaundler and Schlossmann. - Diseases of Children) thinks that they may be due to a temporary outpouring of hydrocephalic fluid. The brain substance itself may be the seat of inflammatory changes. The cerebral arteries are affected with an endarteritis, which causes thrombosus and may lead to softening of the brain, etc. Nothing is known regarding the possibility of early involvement of the spinal cord. Especially in cases showing syphilides, changes in the blood have been found; these consist of a diminution of the red blood-curpuscles and haemoglobin with a corresponding increase of the leucocytes. The bones are involved almost as frequently as the skin, and those portions that grow most rapidly attract the syphilitic poison; so it happens that the most important and frequent changes occur in the epiphyses of the long bones. The condition is known as the osteochondritis of Wegner (loc. cit.); and the changes consist of proliferation of the cartilage cells, calcifcation with delayed ossification and necrosis of the cartilage cells on account of the interference with the blood-supply. The result of these processes is deformity and at times a pseudoparalysis. Periostitis is often found in the cranial bones, which results in nodes and natiform skull.

(B) LATE HEREDITARY SYPHILIS.

The lesions of late hereditary syphilis are similar to those which are observed in the acquired form of the disease; but some of the complicating affections are more common, such as the ocular troubles. These late cases usually have a history of snuffles in childhood, though this is not always so. It is only comparatively seldom that gummata are observed in the skin. The periosteal changes are more diffuse than in the adult disease, and sometimes affect the entire length of the bone. This diffuse process is more common in the tibia, to which it imparts a peculiar and characteristic outline. The shaft of the bone is thickened in all its diameters, but especially in the antero-posterior; there is no deviation in the axis of the bone. The term "sabre-tibia" has been applied to this condition. One of the best known of the later manifestations of hereditary syphilis is interstitial keratitis. It is most common about the age of purberty, and begins with the development of an opacity in the cornea of a painless character; this opacity increases in extent until the cornea has a ground-glass appearance, and pericorneal injection becomes marked. The membrane soon becomes pink from the ingrowth of blood-vessels, and

resolution, as a rule, begins when this occurs. The process is very slow, and it may never completely disappear. The usual subjective symptoms are plotohobia and dimness of vision. Iritis is not infrequently observed, and ordinary retinitis sometimes develops at the age of twenty-one. The dental stigmata of hereditary syphilis are due to arrested development of the teeth in the process of formation. The permanent teeth show the characteristic changes which Jonathan Hutchinson (loc. cit.) has so graphically described, and which will later on be referred to. Congenital syphilitics are not infrequently deaf. It may occur without any warning at any time; and one should strongly suspect a syphilitic factor when a patient suddenly loses his hearing. Articular lesions are of the ordinary syphilitic type, and there may or may not be coincident involvement of the bone. The knees and shoulders are most often attacked. The class which has no bone involvement is usually affected with a synovitis, which resolves without impairing the function of the joint. When the bone is affected the condition is more serious, and permanent lesions are sometimes observed.

ANALYSIS OF THE SYMPTOMS.
ACQUIRED SYPHILIS.

FEVER.

Even the earlier writers on syphilis were aware of the fact that the affection is not invariably one of apyretic course; numerous instances of pyrexial manifestations were by them from time to time recorded. Quite a number of more recent observers tell of high temperatures in syphilitic patients; and it would seem that the number so affected would be increased were the thermometer used more frequently. The present opinion is that the majority have no febrile symptoms and pass through secondary syphilis without knowing that they are ill. The minority, however, are aware of the fact and have some degree of fever; in some it is so slight that it passes unobserved, while in others it is an outstanding feature and cannot be overlooked. For obvious reasons syphilitic fever is more commonly observed in hospital than in private practice. Fournier (loc. cit.) says that he has found a rise of temperature in 33 per cent. of his hospital cases, and rarely amongst the more affluent classes.

Preliminary Fever.- Although during the stage of incubation and for eight or nine weeks the patient may be without symptoms, he may suffer from debility, anorexia, hebetude, and pallor and in some cases an elevation of temperature occurs. Lang says that this may be ushered in with a chill and have such accompaniments as pains in the limbs, sickness and headache.

Fever of Invasion. - After the syphilitic poison has left the chancre and invaded the system by successive instalments to produce a constitutional infection, a rise of temperature occurs. Not infrequently, however, the symptoms of constitutional syphilis make their appearance when no febrile symptoms can be demonstrated

either objectively or subjectively; in these cases the probability is that the migration of the virus into the fluids of the body is distributed over a longer period of time, and taking place so gradually is not observed. We must therefore conclude from the clinical phenomena that the passage of the virus into the blood either takes place gradually or that larger quantities enter the circulation at once, or in several distinct instalments. It would seem also, from the fact that the constitutional symptoms of the disease are sometimes ushered in with fever which may occasionally attain a high degree, at other times without pyrexia, that in the latter case we have simply to do with persons who have a lowered irritability of certain nerve centres. It is impossible to forecast when a case will be either mild or the reverse in this respect; nor can we determine in how far the high temperature or the fever of invasion is destructive to the spirochaete pallida, rendering the course of the disease milder. Still it has frequently been observed that such intercurrent affections as pneumonia, erysipelas, variola, enterica, or rheumatic fever have a strikingly favourable influence on the course of the syphilitic attack. One must be careful to distinguish the fever of invasion, which occasionally marks the beginning of the constitutional affection, from that which is usually observed in the later course of the disease, in extensive osseous or muscular disease, grave ocular affections, and in processes accompanied by suppuration and disintegration, such as pustular and ulcerative processes; in the latter cases, which are very numerous, it is probable that the fever is rather due to the pyogenic microorganisms than the spirochaete pallida. Despite the fact that the latter germ may be at certain times equally distributed throughout the circulating fluids, the abnormal irritative condition of the vessels in general, and of the cutaneous vessels in particular, will greatly influence the final quantitative participation of individual organs and tissues. It is possible that the increased irritability of the vasodilators or the lowered function of the vasoconstrictors may exert a predominant influence here, inasmuch as dilated vessels, as a rule, will allow a larger quantity of the virus content to transude. In the later stages of the syphilitic process pathological changes may be expected only in those places where the virus was deposited after the first invasions, so that there would seem to be a certain regulatory effect in the fever of invasion as regards the distribution of the specific poison throughout the patient's system. It is yet too early in our knowledge of the disease to say why syphilitic affections of the internal organs occur more rarely, or in less pronounced degree, in individuals who have, at the time of the generalisation of the disease, a copious eruption on the skin and mucous membranes. Now that attention has been directed to the matter further information on this question will doubtless soon be forthcoming; something has already been discovered regarding cerebral syphilis by those who have reported that the greater number of patients who have symptoms of cerebral syphilis have suffered from a

remarkably small number of syphilitic exanthemata. It has long been known that the fever which accompanies the development of constitutional symptoms usually presents a certain type, the remittent character of the hyperthermia being particularly noted. Despite the fact that suppuration and the products of disintegration occurring in the course of syphilis quite frequently influence the character of the fever, it is probable that the later processes also are accompanied by a specific syphilitic fever. The fever of invasion, however, will nearly without exception retain the character of a purely syphilitic fever. This fever usually makes its appearance, when it is at all marked, from seven to eight weeks after the infection. From this it follows that, with certain exceptions, the passing of the greater quantity of the virus into the blood-stream, and together with it the appearance of the constitutional symptoms of the disease, occur about seven or eight weeks after infection. The constitutional affection has, however, been observed much earlier, even in the fourth week, and occasionally also much later. The fever of invasion is also sometimes called the "syphilitic fever of eruption," for the reason that the appearance of an eruption on the skin or mucous membranes nearly always accompanies it. It is not always ushered in with a chill; usually it is expressed in such accompaniments as headache, malaise, general depression, weakness of the knees, and very often rheumatic pains; anorexia or perhaps an inordinate craving for food is complained of; and in certain cases the pain assumes a neuralgic character. Together with these subjective symptoms, which are especially painful in the afternoon or at night, there is a rise of temperature to 104.F., or even sometimes to 105.8.F., or over, in the evening, with morning remissions reaching nearly to normal. This fever lasts two, three, or four days, rarely longer; after it has existed for a day or two, a faint diffused blush is observed here and there on the trunk; but this rapidly disappears to make way for the eruption of the true cutaneous syphilide, which is due to a hyperaemia and a more or less pronounced infiltration; it also occasionally makes its appearance on the mucous membranes. The subjective symptoms continue for a considerable period, perhaps one or two weeks, in rare cases only as a rule they will have already begun to diminish before the eruption makes its appearance, and will soon disappear altogether; the temperature begins to fall only after the eruption has appeared, but a day or two later defervescence is complete. Despite the fact that the skin eruption continues to increase during the following days and weeks, by the appearance of successive syphilodermata or mucous-membrane lesions, this usually occurs without any febrile symptoms. A fever of pronounced remittent type, lasting a day or two is, however, quite frequently observed as an accompaniment of subsequent eruption, as well as of recurrent cutaneous and mucous-membrane exanthemata. But this fever never reaches the height of that just described.

Tertiary Fever. - The occurrence of fever during the tertiary stage of syphilis has led to not a few errors in diagnosis, especially as it may be continuous - indeed, of any known type. The following are some of the affections which may present diagnostic difficulty:

Rheumatic Fever. - Confusion here arises owing to the possibility of nodes in proximity to joints with accompanying enlargement and fever. But in syphilis there will be nodes elsewhere, as on the clavicles, and various other symptoms of specific import as well.

Malaria. - The occurrence of fever in syphilitics resident in malarial districts has been known to lead to diagnostic error, the more so as syphilitic fever, as we have seen, may assume any type. Careful study of the case, however, should speedily clear up the difficulty.

Typhoid Fever. - Some authors affirm that they have sometimes experienced difficulty in diagnosing typhoid from syphilitic fever; but the study of the case from every standpoint and the effect of treatment has in every instance converted doubt into certainty.

Tuberculosis. - Error is even more liable to arise here; and a careful bacteriological examination has not infrequently been required for determination.

CHANCRE.

In the case of a person who has not previously suffered from syphilis, or who bears no immunity to the disease, the point of entrance of the virus, if it happen to be an abrasion, a cut, a puncture, or any trivial injury of the skin or mucous membrane, will heal in a few hours like any other slight lesion. Nor does the point of entry, within the period of incubation occupied by the following few days, show any evidences of special infection or injury. But, after a period of incubation, if the poison has taken effect, an initial manifestation appears; to it the name of CHANCRE has been applied. It commences as a spot of erythema, which in a few hours becomes a superficial papule; it gradually extends in circumference and depth, loses its epithelial or epidermic covering, and in the course of a few days is surrounded by an area of induration. This represents the development of a typical chancre. Frequently, however, the chancre when first seen appears as a fissure or abrasion, or, if located in the on the mucous membrane, as a superficial ulceration covered by a grayish or yellowish false membrane. In not a few cases there is solution of the continuity of the skin covering a chancre, but merely a gradual thinning of this layer of the skin from the margins towards the centre. It forms, when actual ulceration exists, a simple cup-like depression, with sloping margins and smooth surface, in the centre of which is a false membrane; beneath this is a granulating surface, which bleeds easily when it is touched. The chancre has also been termed the Hunterian chancre, the infecting chancre, the hard chancre, the indurated neoplasm, the primary

sore, and the initial sclerosis. The chancre is usually single. But when the virus has been inoculated at the same time in several places a number of sores may appear; they do so, however, simultaneously, and are never due to inoculation with the secretion of the first chancre of the surrounding or apposing surfaces.

Histology.

The use of the microscope shows that the chancre consists of a proliferation of the cells of the connective tissue of the skin, which in the beginning are found along the smallest blood-vessels; and the process must therefore be regarded as in part a proliferation of the elements of the walls of the vessels, and in part also as a migration of the leucocytes. In the course of its further development the new formation of cells extends between the small blood-vessels, so that sinally the papillary layer, the rest of the cutis, and the subcutaneous tissue appear equally infiltrated. Gradually there occurs a thickening of the media of the vessels and proliferation of the intima; changes which are found in arteries as in veins, and which finally produce contraction and even obliteration of their lumen. These processes are analogous to arteries and endophlebitis. The same changes are not seen in the lymphatic vessels, the lumen of which may even appear larger than normal. Corresponding to the sclerosed parts there are sometimes interpapillary epithelial depressions of various shapes, like pegs or offshoots, penetrating through the infiltrated cutis; at other times the borders between the papillary layer and stratum Malpighii are obliterated. In such cases the new cells of the cutis are forced always towards the surface, the epithelial stratum appears thinner and thinner, and finally disappears, - erosion, - or the infiltrated cutis, deprived of its epithelium, breaks down entirely, - ulceration. In retrograding chancres we find few cellular elements, but shrunken shreds of connective tissue. In old chancres giant cells are occasionally found, as also other changed similar to those existing in the papillary layer, sometimes extending into the subcutaneous stratum, but principally confined to the papillary layer, starting from the blood-vessels; the papillae are usually longer and broader, and the interpapillary growth onwards of epithelium is often interspersed with young cells in a state of proliferation. In this way the skin becomes moist and is rapidly thrown off.

Symptoms.

The characteristic syphilitic chancre makes its appearance as an infiltrate, from the size of a lentil or pea to that of a shilling, which lies in the skin or mucous membranes and the underlying connective tissue as a sharply-defined body, projecting somewhat above the surrounding level and in colour somewhat red. In from five to ten days the chancre assumes the well-known and characteristic induration, which usually reaches its maximum in about a fortnight after its first development. In some cases, however, there is no induration. It is present and distinct in the vast majority of cases, but may appear in different forms. As stated, this hardening is due about the primary

lesion is due to a cellular infiltration of the connective tissue and of the coats of the small veins and small arteries of the part, affecting the adventitia of the latter. The induration is due to the thickening of the walls of the blood-vessels and the accompanying cellular infiltration. The vascular supply of the skin consists of two horizontal networks of vessels: one beneath the papillae, the other in the deepest portion of the skin. When only the superficial network of vessels is sclerosed there is simply a surface induration; when both networks, together with the intermediate branches, are affected, there is a distinct nodule, varying in thickness according to the extent of the skin surface involved. As a rule, the vascular sclerosis is continued far beyond the area of induration, but usually in such a comparatively slight degree that the line of demarcation between the borders of the chancre and the surrounding tissue is clearly defined. There are four kinds of induration according to depth of the lesion: First, laminated induration, in which the hardening around the chancre, though distinctly outlined from the surrounding tissues, forms a layer so thin that it gives to the examining fingers a sensation as if a disc of writing paper had been inserted in the superficial layers of the cuticle. Second, the parchment induration, which is somewhat thicker than the laminated induration, giving on palpation the sensation as if the lesion were placed on a disc or parchment. Third, nodular induration, in which, in the absence of acute inflammation, we find the most characteristic form of sclerosis. It is hard and thick, feeling like a nodule of wood or of cartilage. In typical cases of this character not only the vessels of the skin, but also those of the subcutaneous connective tissue are implicated. The presence of malignant growth has been diagnosed in certain cases with intense induration of this character. Fourth, annular induration, which affects only the margins of the chancre, a hard ring of almost normal elasticity being formed about the centre. The easiest way to appreciate the presence of induration is to gently pinch together the soft parts outside the lesion till the hardened edges are felt by the thumb and fingers placed in opposite sides of the sore; the depth and extent of the sclerosis can be readily determined on lifting up the entire lesion upwards from the underlying structures. The extent of the induration varies with the seat of the chancre. When occurring on the glans penis, upon the mucous membrane of the prepuce, or in the coronary sulcus, the chancre is usually very distinctly indurated. Upon the skin of the penis and the general integument induration is not so marked. In females the induration of the primary lesion is far less distinct than in men; when the chancre is situated upon the labia majora the characteristic sclerosis is more appreciable than when on the labia minora or fourchette. An ulcerated chancre will usually heal in from four to six weeks, the induration not lasting much longer than this, though, if it has been distinctly nodular in character, it may persist for months and even years, or, after having

entirely disappeared, may again make its appearance in the form of the so-called pseudochancre, of which the literature contains several instances.

Locations.

The chancre, whether it be in the form of an erosion, sclerosis, or papule, is very often, perhaps usually, single; yet it is not rare to observe two, three, or more lesions on as many different parts, as, for example, the prepuce, glans penis, and urethra, or the clitoris, remains of the hymen, and labium majus. If at the time of exposure the necessary conditions for infection exist in several places, the initial lesions may be multiple; sometimes the lesions are both genital and paragenital, and occasionally they may exist on widely separated parts. There is great variation possible as regards the seat of the chancre, and no part of the body is outside the pale of infection if the condition of the same are favourable. The affection acquired in other ways than by normal sexual intercourse is usually the result of disgusting sexual practices; to other cases the name syphilis insohtium has been applied. The extragenital chancre is usually found on the lips, the mucous surfaces of the mouth and pharynx, about the anus, and on or near the nipple. In the case of the mouth the chancre is generally found on the tongue, exceptionally on the tonsils or the palatine arches. Surgeons, accoucheurs and midwives not uncommonly contract chancres on the fingers or hand. As a rule, extragenital chancres are acquired in innocent ways; even the anal chancres not infrequently encountered in females are usually due to infection by discharges trickling backwards from the vagina. Extragenital chancres rarely present the typical features of the sore as observed in cases of genital location. Sometimes the lesions are so slight as to attract scarcely any attention; more commonly inflammatory symptoms become so severe that characteristic induration, if present, is entirely masked, and, except in the general symptomatology of the case, there is nothing to stigmatise them as specific in character. Chancres of the lips and face are not infrequently much larger than the average genital sclerosis, and extensive ulceration in connection therewith has been observed.

Genital Chancres. - The commonest sites for genital chancres in men are either on the preputial mucous membrane in or just behind the coronary sulcus, on the surface of the glans penis, - especially in the region of the fraenum, - and about the margin of the preputial orifice; about 75 per cent. of all chancres are in one or other of these places located. It is sometimes found also in the urinary meatus, on the skin of the penile organ, in the urethra, or on the groin or scrotum. The chancres found in the commonest situations, i.e., on the mucous membrane of the prepuce just behind the coronary sulcus, etc., - show the characteristic induration in its highest degree. It is not infrequently slight and the chancre of an inflammatory nature when located upon the surface of the glans penis, in or near the fraenum, and about the urinary meatus. When occurring

on the free edge of the prepuce, the induration may not be discoverable, or it may show a very hard ring. In the case of females the chancre is usually found on the labia majora or labia minora. Such chancres are not infrequently located in the regions of the fourchette and the clitoris, and have occasionally been observed about the os uteri. They are scarcely ever seen upon the surface of the vagina, although this structure is more exposed to contagion than any other surface. This immunity is due to the constitution of the mucous membranes of the part, which efficiently resists the invasion of the spirochaete pallida by virtue of its projecting thick layers of flat epithelial cells and the absence of glandular orifices. The induration of the chancre is far less marked in females than in males; the typical charply-defined and circumscribed cartilaginous hardness is very seldom observed; it is replaced by a more diffuse and less sharply-defined infiltration, often very little greater than may sometimes be seen in non-syphilitic affections in the same locality. Despite the fact that the chancre may assume a large variety of forms, most of the cases belong to one or other of the classes which have for convenience sake been recognised. Thus we have chancrous erosions, chancrous ulcerations, and indurated papules, and in that order of frequency; in exceptional instances one may encounter erratic forms of chancre which cannot be so classified. There are three main varieties of these, namely, the multiple herpetiform chancre, the so-called silvery spot, and the mixed chancre. The first-mentioned closely resembles herpes, but does not present the multiple circinate margin of the latter, does not give the characteristic exudation of herpes on pressure, and has a history peculiar to itself. The so-called silvery spot is a lesion such as may be produced by the application of a finely-pointed pencil of nitrate of silver, is usually situated on the surface of the glans penis, and not infrequently resolves itself into the chancrous erosion. The third erratic variety, the mixed chancre, is a lesion which results from infection with both the spirochaete pallida and the chancroidal bacillus. The chancroid pursues its typical course and may be healed before the syphilitic induration is observed, though more often there is a persistent chancroidal ulceration with appearance of the true syphilitic sclerosis around it in usual course. It would seem that 75 per cent. of all genital chancres are of the nature of chancrous erosions. The lesion at first looks like a small abrasion, such as might result from a very slight scratch with the finger nail. As the chancre develops it becomes oval or round in shape, is surrounded by a dusky-red areola, presents a polished raw surface, the central portion of which is covered with a gray false membrane, and discharges a small quantity of blood-stained serum. The lesion is an exfoliation of the epidermis, exposing, but not destroying, the true skin. The induration, though sometimes nodular, is generally parchment-like, and develops, as a rule, within seven

days after the erosion is observed. The chancrous ulceration is a form of chancre which shows deeper ulceration than the chancrous erosion. The latter causes epithelial desquamation; the former involves the true skin, or, in its more exaggerated form, the subcutaneous tissues. The ulceration in this variety observed may be either superficial or deep in character. Fournier calls the superficial form of chancrous erosion the "exulcerative chancre"; it attacks the true skin, but does not entirely destroy it. An ulcer is formed of moderate depth, with sloping edges and a scanty sero-sanguineous secretion. The granulating surface is frequently covered with a grey and adherent false membrane. Being more of a nodular than a parchment type, the induration is more marked than in the chancrous erosion. What the above-mentioned author terms the "ulcerative chancre," that is the deep form of chancrous ulceration, is not at all common. There is formed a deep ulcer with sloping edges, moderate serosanguinelent discharge, and typical extensive cartilaginous induration into which the ulcer gives one the impression of worming its way. The indurated papule is the primary lesion of syphilis which differs from the chancrous erosion in the fact that the skin is not broken. A hard, raised, dusky-red tubercle is formed, sharply defined from the surrounding tissues. The surface is dry, but frequently is crusted with layers of exfoliated epithelium. The papule may be large and prominent, or so small that the subject of the disease may never know it is there.

Complications. - Various complications of chancres may be observed, depending on certain well-recognised conditions and vary considerably at times changing the clinical picture of the initial lesion of this disease. Thus, infection with the ordinary pyogenic microbes may give rise to a simple inflammatory condition in the chancre, especially if the latter be exposed to irritating applications, to friction, or to any mechanical injury which will render the invasion and multiplication of these germs convenient. Indurated oedema is another complication in which a hard oedema develops about the chancre, there being produced by this firm oedema-like infiltration of the skin and subcutaneous tissue a considerable increase of volume of the affected part. It is peculiarly a genital complication and seldom or never seen in extragenital lesions, though it may occur in connection with the lesions of the constitutional stage, usually the papular syphilides. It would appear that the original syphilitic focus is the starting-point of this affection, which may, however, readily and gradually pass beyond its early limits and develop still further. The whole of the prepuce and also the greater part of the skin of the penis is converted into a hard, elastic, even swelling, of such a degree that the penis may become as bulky as an infant's leg. The skin is dark or dirty-brown in colour, usually smooth and not pitting on pressure with the finger. The borders of this hard oedema are sometimes indistinct and at other times very sharply defined, and within them the chancre of the syphilitic papule is usually plainly to be seen; some-

times we can feel hard, nodular, lymphatic cords through the thick skin of the penis. The affection advances very slowly, and it rarely reaches the mons Veneris or skin of the scrotum; when the scrotum is invaded, there is an exaggeration of the normal markings of the integument of this region. There is no sensitiveness, redness, or increased temperature: no symptom, indeed, of any inflammatory condition. Suppuration has been reported as the rarest possible complication. The oedematous condition, left to itself, undergoes slow resolution; but the usual specific medication brings about a speedy cure. In the case of females the indurated oedema presents a similar clinical picture; the labia majora, the prepuce of the clitoris, and sometimes the labia minora are affected. If originating from a chancre, the chancre begins usually asymmetrically, as the initial lesion is generally unilateral. It may begin in one labium majus, for example, and remain on one side for a long time; but at the expiration of several weeks or even months it may extend to the other side, and also upon the public region. Owing to their greater neglect of the chancre, females show this condition to a severer degree than males. Mixed infection is another condition sometimes observed. Here the evolution of the chancre is considerably modified by the conjoint infection with the bacillus of some other morbid process. It is usually the bacillus of soft chancre which gains access to the part in conjunction with the spirochaete pallida. Should the patient himself or another person be inoculated in a part covered with healthy skin and pus taken from a soft chancre which is still in the destructive stage, there is immediately after the inoculation puncture a slight redness of the skin, lasting for a few minutes only. Then, at the end of from twenty-four to forty-eight hours, there appears at the point of inoculation a small nodule, the size of a millet-seed or larger, and surrounded with a red area. Suppuration occurs in this nodule immediately, and within a few hours it is transformed into a pustule the size of a pinhead or larger. The pustule soon breaks or dries up to a scab, which falls off, leaving an ulcer, with more or less uneven base, encroaching upon the corium somewhat. The border of the ulcer is round or uneven, but always sharply cut. The secretion is thin, cloudy from admixture of particles of necrotic tissue; the adjacent parts are in a state of inflammatory irritation. A similar course is observed when infection occurs during coitus. In the following days we usually observe that the surrounding tissue breaks down, and an increase in area and sometimes also in depth of the ulcer results. The edges and base of the ulcer appear unclean and uneven, on account of the adherent necrotic particles of tissue. In this destructive stage inoculation with a small quantity of the secretion produces an ulcer having the same course and character. Furthermore, accidental contact of the secretion with an abraded surface, or even a prolonged contact with tender epithelium, results in the production of the same ulcer. This is the

explanation of the autoinoculation, through which several successive venereal ulcers may arise in close proximity to each other in the same individual. Sometimes there is imflammatory swelling in the adjacent lymphatic glands, which then usually suppurate and give rise to a bubo. Sometimes this pus, as well as the secretion of the original ulcer, possesses the quality of producing a new ulcer by inoculation, and in this case the contagium muct have reached the lymphatic gland. Sometimes we find that the virus, in its passage from the ulcer to the lymphatic glands, excites inflammation in the lymphatic vessels through which it is conveyed, and this lymphangitis results in the formation here and there of small abscesses, - bubonuli or Nisbeth's chancre, - the pus of which can also give rise to a soft sore. So long as the lesion retains its ulcerative character the secretion of the soft chancre remains contagious, however; after the inflammatory reaction has once disappeared and the ulcer has ceased to enlarge by disintegration of the neighbouring tissue, when all the necrosed particles of tissue which were adherent have been torn off, we find that the base of the ulcer clears and normal granulations spring up; the border then appears closely adherent, and very soon encloses a ring of newly-formed eputhelium; in short, we find in place of an ulcer a healthy granulating surface, which is progressing towards a cure. In this stage, which is called the stage of repair, and which generally makes its appearance after the ulcer has existed a few days or a few weeks, the contagium already seems to be destroyed, as it is no longer possible to make fresh inoculation with the secretion. As in the case of the original veneral sore, the second and third which have been produced by autoinoculation, as well as any suppurating lymphatic glands, also lose their contagiousness in the stage of repair. Any such would complication as erysipelas and diphtheria and gangrene may, of course, attack the venereal ulcer. In former times, prior to the general adoption of calf lymph, humanised lymph was used for vaccination, and then vaccine virus and syphilis were sometimes inoculated simultaneously. In these cases of vaccination syphilis the vaccine pustules and the primary lesion of syphilis were developed independently side by side, in which case their respective incubation periods were not infrequently sharply defined, with now and then minor variations. From the very nature of the case, a simultaneous inoculation with syphilis and a soft sore is not improbable occurrence; or the two viruses may be derived from different sources, and introduced at different times through the same port of entry. Assuming the case of a contemporaneous action of both contagia, the venereal ulcer with its very short period of incubation will certainly make its appearance before the syphilitic chancre than does the vaccine pustule; it may continue to develop or even progress towards repair and cure during the incubation period of syphilis. The syphilitic chancre which develops later will thus complicate the chancroid in the stage of ulceration or in that or

repair, or else will make its appearance after the latter has already healed. In these cases the surroundings and base of the chancroid will gradually assume a sharply-defined induration, which, notwithstanding that the ulcer is progressing towards a cure, will develop to a certain degree, or the cicatrix of the ulcer which has already healed will be the locality in which the chancre makes its appearance. Should infection with the chancroidal bacillus have taken place one or two weeks after the syphilitic infection, the development of the syphilitic chancre may closely correspond in point of time with that of the soft core. Another complication of a chancre is the formation of a papillary outgrowth and conversion of the chancre into a mucous patch or a condyloma. In this condition in association eith the chanc e there is often an abundant outgrowth of warts, such as are common in balanoposthitis or other inflammatory condition of the glans penis and the prepuce. These warts seem to be due simply to irritation, and are not specific in their nature. The chancre itself loses its induration as secondary symptoms develop, becomes covered with gray false membrane, and presents all the characteristics of a mucous patch; or the papillary layer of the skin may proliferate, forming a condyloma, a broad, flat elevation, a fray and adherent pellicle covering its surface. Other complications of the initial lesion of syphilis are phagedena and gangrene. The former may be regarded as the result of inflammation more rapid and intense than that which characterises the inflamed chancre. The engorgement becomes so great that there is less of vitality, and sloughs are formed, or gangrene may attack the tissue. In rarer cases there is a slow progression of the trouble, and the name serpiginous is then applied to it. Phagedena is more liable to occur in individuals of depressed constitution; still, it is sometimes seen in the robust. There would seem to be a systemic predisposition, which is not in a few cases successfully combated by mercurial treatment; the exciting cause is, however, purely local, as is demonstrated by the fact that in the same individual one chancre may become phagedenic while it may run an uncomplicated course in another. The affection may attack the initial lesion at any stage of its development, or may complicate any of the secondary or tertiary ulcerations of the disease. If rapid, it destroys the induration more quickly than it can form, and thus obscures the characteristic features of the initial lesion of the disease.

Lymphatic Phenomena.

Together with the development of the primary lesion of syphilis there is a notable alteration in the anatomically related lymphatic vessels and glands - the condition produced being respectively lymphangitis and lymphadenitis.

Lymphangitis. - Affection of the lymphatic vessels of the part occur in about a fifth of the cases during the first week. It is a less common lesion than glandular affection. This lesion is more often seen in the lymphatic vessels of the penis. On the under surface of this organ one or more hard, knotty cords,

from the thicknees of a thread to that of a piece of string or thicker still, may be felt under the skin; these are, as a rule, only slightly tender, and may be generally traced to the root of the penis and from here occasionally as far as the lymphatic gland; sometimes the affection begins at the seat of the chancre, in which case the network of lymphatic vessels situated behind the sulcus can be felt through the skin on one or both sides as a hard mass. This indurated lymphangitis is not ordinarily accompanied by an acute reaction; we do not therefore find any change in the skin as a rule, though the latter is occasionally oedematous, and more rarely presents streaks of redness. The condition is, of course, most often encountered on the dorsum of the penis; it may, however, mark the path between the induration and the bubo in other localities as well, as may be seen on the arm and forearm in syphilitic affections of the furrow of the nail, or under the lower jaw in cases of chancre on the cheek, etc. The indurated lymphangitis does not take so long to heal as the chancre and the indolent buboes, and its involution is only a question of time. It is only rarely that we find suppuration of the indurated lymphatic vessels accompanying the chancre.

Lymphadenitis. - After the chancre, the syphilitic bubo is the most characteristic and constant feature of the disease in its primary stage. Consequent on the appearance of the chancre at the end of the incubation period, the virus is carried further into the system, and usually by means of the lymphatic vessels. In the first or second week after the chancre makes its appearance, - sometimes at the same time, rarely later, - the nearest lymphatic glands become enlarged and present in the early period some tenderness, although no signs whatever of an acute inflammation reaction are observed in the gland itself or in the skin which covers it. Tenderness also continues only for a few days, so that later on nothing is observed in the neighbouring lymphatic glands except their enlargement. It was ages ago when the adenopathy which we are considering was termed indolent bubo, to distinguish them from the inflammatory and therefore painful lymphadenitis, which frequently occurs in connection with soft chancres. In exceptional instances one, generally several of the nearest lymphatic glands attain the size of a hazelnut or a walnut, and may remain enlarged for several months, or possibly for years. The inguinal lymphatic glands are most usually the seat of indolent buboes, and for the reason that the chancre in the vast majority of instances makes its appearance on the genitals or in their neighbourhood. When the chancre is situated laterally, the lymphatic glands of the same side, when it is in the median line sometimes the glands on the right, sometimes those on the left are affected; on account of the manifold anastomoses of the lymphatic vessels in this locality, it does not so very infrequently occur that the indolent bubo may be found on the side opposite the initial lesion, or even on both sides. In a few cases the femoral glands or a small lymphatic gland situated on the Mons Veneris also enlarge. At times

the chain of indolent buboes extends towards the iliac glands, especially to the first one, namely, Rosenmüller's gland. In rare cases the glands of the pelvis become enlarged to the size of an orange or more; or, again, the inguinal glands are only very slightly enlarged, in which case it is reasonable to presume an adenopathy of the deep-seated pelvic lymphatic glands. In the case of extragenital chancres, - as on the fingers, the nipple, the lips, the tongue, the eyelids, and elsewhere, - the lymphatic glands in the region of the elbow, the axilla, or the neck, or the preauricular glands become the seat of indolent buboes. Sometimes affection of the nearest lymphatic glands, - as those at the bend of the elbow and the groin, - is missed, and the second in the series, - as the axillary or pelvic glands, - becomes involved. Should the patient have both genital and extragenital chancres simultaneously or nearly so, not only the inguinal glands, but also those of the extragenital region are enlarged. For instance, should the patient have chancres of the chin, of the lower eyelid, and of the finger in addition to one on the penis, there will be characteristic enlargement of the accessory glands of the lower jaw, of the bend of the elbow, and of the preauricular region, as well as inguinal bubo. In general, the affections of the lymphatic glands following the development of a chancre does not go on to suppurations; but as complications, which would in themselves cause a chromic or acute affection of the lymphatic glands, are not infrequently present, so that other injurious factors besides the spirochaete pallida also exert their influence, deviations from the above-described course may be observed. Thus, suppuration of the lymphatic gland occurs as a rule, if the chancre itself becomes ulcerated, if still another inflammatory process is present at the periphery of the glands, - as in chancroidal inflammation, - or if the lymphatic glands has received some kind of injury. Should a chronic, - for example, tuberculous or scrofulous, - enlargement of the lumphatic glands have been present prior to the syphilitic infection, the characteristics of the lympathic adenopathy as usually found in connection with the chancre will obviously be absent; we may then observe, at the most, that an impulse has been given by the newly-added factor to a change in the hitherto indolent course of the adenopathy, so that, at least in some portion, the infiltration accompanied by oedema is increased and terminates in suppuration. The ordinary indolent bubo is in itself inclined to persist for a long time; but the course of these strumous forms of lymphadenitis, complicated by the occurrence of a chancre in its periphery, is an exceedingly slow one. We find in such cases in one or several places with suppurative adenitis and an oedematous, infiltrated condition of the parts immediately about, the course of which is often very late. The pus which is evacuated comes from a greatly ramifying sinuous cavity, in which larger or smaller remnants of the parenchyma of the gland are present, which disappear only slowly by suppuration. This condition of abscess cavity is the reason why, in spite of its contraction, perfect closure takes

very slowly only, and why here and there sinuous fistules may still exist after months, or, in some cases, even years. In such a case we see in the skin covering the partly shrunken glandular tumour one or more narrowed contracted openings from which, at the mouth of the existing fistula, a small quantity of thin puriform fluid can be expressed; occasionally the secretion which has come to the surface dries in the form of a scab, and it is only after the removal of this that one of these sinuses may be discovered. There are therefore not a few factors which determine the occurrence of suppuration in indolent buboes which under the ordinary circumstances would not show it. It is necessary sometimes to distinguish syphilitic bubo from an inflammatory bubo: for which purpose it is as well to bear in mind that the cause of the former is always a chancre, whereas in the latter chancroid, herpes, balanoposthitis, gonorrhoea, or any non-specific lesion may produce it; in syphilitic bubo several glands, usually in both groins are affected, whereas in an ordinary bubo one gland is implicated, and rarely both sides; a syphilitic bubomakes its appearance in a week or shortly after the chancre, whereas an inflammatory bubo may appear at any time during the existence of the lesion causing it; the symptoms of syphilitic bubo are small enlargement, indolence, painlessness, movability, absence of inflammation, non-adherence to the overlying skin, and cartilaginous hardness; whereas in the inflammatory bubo we have a large, tender, painful, acutely inflamed neoplasm, adherent to the skin, with a hardness, redness and not of inflammation and nothing else; the one terminates in resolution, whereas the other not infrequently proceeds to suppuration; and, lastly, in syphilitic bubo local remedies are without effect and mercurials effect a speedy cure; whereas in inflammatory bubo local treatment is curative, and general specific medication is useless. In the case of scrofulous and tuberculous buboes we must depend largely on the history of the illness and the mode of development of the swelling; the latter will neither increase nor decrease in size unless the inflammation occurs, in which case suppuration is observed. A tuberculous family history, together with the other well-known features of the dyscrasia are of importance, and the course of the affection is entirely different.

Diagnosis of Chancre.

General Diagnosis.

It is generally easy enough to recognise a chancre wherever occurring, though now and then certain modifying conditions may occur which make the contrary certain. Thus cauterisation of a venereal wart causes a cicatrix which might be mistaken for a scar-relic of a chancre; and an unimportant mechanical lesion, such as a desquamation or a tear or a fissure, around the genitals may, upon the occurrence of a slight inflammation produced by infection with pathogenic germs, assume a suspicious appearance and lead, by virtue of

its position, to a wrong diagnosis of syphilis. Consequently, the history of the case should always be inquired carefully into, with special reference to exposure to infection, the evolutionary phenomena of the lesion, and the condition of the lymphatic glands. On no account must gummata be mistaken for a chancre; and we must bear in mind that should, for instance, the latter be concealed within the prepuce further difficulties may arise. Should there have existed phimosis from the beginning, or should the chancre within the prepuce have a coincident contraction of the external orifice of the covering structure, a so-called inflammatory phimosis, it is impossible to see the chancre within the preputial sac; but even here we ought to be able to diagnose the presence of the initial lesion. Externally there is no change visible, or there may be, at the site of the chancre, a small protuberance of a more or less red colour. But if we palpate successively the corona, sulcus, and fraenum, the existence of an induration will be noted. The firm, uneven surface of the sharply-defined, indurated, and sometimes sensitive infiltration is so marked that it can scarcely be mistaken for anything else. No importance can be attached to the occurrence of a discharge from the prepuce, as it is dependent upon the degree of erosion or ulceration. We may suspect the presence of a soft chancre in the preputial sac if the external surface of the phimotic prepuce is intensely red and swollen, and especially if it should be very sensitive on one or another part. If these symptoms are absent, an existing discharge from the preputial sac may be regarded as due to gonorrhoea or to a simple or perpetic balanoposthitis. Chancres on the mucous membranes present usually the same clinical features as those on the skin; but the epithelial layer desquamates sooner in such cases, and consequently erosion and ulceration are more common results. The induration is then ordinarily covered with a whitish, scurfy epithelium, or is converted into an ulcer, more or less covered with secretion, or occasionally red and smooth. A chancre may be concealed in any portion of the urethra, from the meatus to a point an inch above the fossa navicularis; above this it seldom or never develops. Erosion usually follows quickly and produces some mucopurulent or purulent discharge, which draws the attention of the patient to the possibility of a gonorrhoeal infection, although he cannot understand why it appears so long after the coitus. The burning sensation which accompanies gonorrhoea during micturition is absent or very mild, but the fact of a discharge from the urethra induces the patient to present himself for treatment, with the result that the medical attendant not infrequently diagnoses a mild urethritis. Careful examination of the anterior portion of the urethra soon shows a circumscribed, hard, sometimes sensitive infiltration of cylindrical or sindle-like form and of small dimensions. Its longitudinal axis coincides with that of the urethra. The infiltration can be easily found by pressing with the thumb and index finger the glans, sulcus, and other parts of the penis one after the other in regular order, and by palpating the urethra materially. In this way it

is ascertained that the sclerosis occupies either the entire circumferance of the urethra or simply one part of it. Seldom two or three perfectly distinct swellings are observed. Sometimes there is at the same time another chancre externally on the penis or some other part. On endoscopic examination the introduction of the tube reveals a stricture of variable calibre, according to the degree of infiltration, in which case a smaller tube must be used. With this we are able to detect a displacement or a distortion of the central image, according as the chancre is cylindrical or occupies only one side of the urethra. After removing the thin layer of secretion, we observe a difference in colour if the eroded or ulcerated surface of the chancre is coated. In gonorrhoea great swelling and infiltration of the urethra occur, and this may very closely resemble a chancre of the part. As a rule, this inflammatory infiltration of the submucous layer, when it is very extensive, occupies a large part of the urethra; but the detection of gonococci in the abundant discharge, even when the lesion is small, will clear up all difficulty in diagnosis. The use of the endoscope is also of service in cases of venereal warts which sometimes occur in the anterior portion of the urethra, and which are expressed in great sensitiveness, swelling, redness, though there is no sharply-circumscribed urethral induration.

Differential Diagnosis.

The question of the differential diagnosis of the primary lesion of syphilis is one of great importance since lesions of the genitals may be due to a great variety of causes, and as a syphilitic chancre may assume such forms as the simple or multiple, the eroded papule, the ulcerating papule, the fissure, an apparently simple erosion, and a slight infiltration. Furthermore, other varieties of the chancre may be observed, owing to complication with non-specific lesions, particularly with a soft chancre. It is very often no easy matter to distinguish between a mixed chancre and a soft chancre; and it is not judicious, even should a chancroid be absolutely typical in all its clinical phenomena, to tell a patient that there is no fear of the subsequent development of the specific lesion. Despite the most favourable course of a simple ulcer, after two or three weeks characteristic induration may develop, and in another week the inguinal glands on both sides enlarge painlessly one after another - in which case it is probable that syphilis and a soft sore have been contemporaneously inoculated. On the other hand, if a non-inflammatory indurated sore appears at an interval of more than ten days after coitus, and in consequence of further exposure rapidly assumes an inflammatory type, sloughs, and extends beyond the area of induration, destroying the latter, and presenting on examination only the features of a simple venereal sore, the probability is that the lesion is a mixed chancre, the chancroidal virtue having been inoculated upon the primary lesion. This probability is approximated to a certainty if painless multiple and enlarged lymphatic glands are found in the groins.

As each disease will run its course independent of the other, even should a suppurating bubo form, this should not affect the diagnosis as regards syphilis. It is important to bear in mind such facts as the following: In the case of the ulcerated syphilitic chancre the period of incubation is counted by days, and lasts on an average about three weeks; whereas the period of incubation of a venereal ulcer is counted by hours and rarely lasts longer than two days. A syphilitic chancre makes its appearance in the form of an infiltration, which either rises above the surface as a papule or may be recognised in the skin or mucous membrane as a distinct induration; whereas in chancroid a small nodule makes its appearance, surrounded by an areola, at the point of entrance of infection, and almost immediately proceeds to suppuration, becoming converted into a pustule. A syphilitic chancre very easily becomes eroded and breaks down, usually forming a shallow ulcer with a reddish lustre, as though varnished, which secretes but little, or else there is a deep ulcer in the centre, which looks as though covered with a deposit of necrosed tissue remnants, having usually a closed adherent edge sloping off gradually to the level of the surrounding parts; whereas in a soft chancre after the covering of the pustule is thrown off, or after the crust, which is formed by the drying of the contents of the pustule, is shed a deep painful ulcer with an unclean base and sharply cut, irregular and occasionally also undermined edges is presented. The base and neighbourhood of an ulcerated chancre usually still presents signs of the original initial lesion in the shape of induration or a papule; whereas the base and neighbourhood of the chancroid for a few days present the signs of an acute inflammatory reaction, which lasts as long as the ulcer is undergoing enlargement. The secretion of a syphilitic initial lesion only rarely causes symptoms similar to the initial lesion on the patient, so that the chancre is therefore very frequently single, the lesions being multiple only when when the virus has entered the system at the same time from more than one point, or in cases of postinitial infection very seldom observed; whereas the secretion coming from a soft sore is capable of giving rise to similar ulcerations in the neighbourhood by autoinoculation, for which reason venereal ulcers are nearly always multiple with successive appearance of the lesions. The ulcerous erosion of a syphilitic chancre very soon cicatrises when properly treated, although the original infiltration, may persist long, and a return of the ulcerative process is possible so long as this is the case; whereas in a chancroid healing results only when the ulcer has cleared up and the signs of the acute inflammation have disappeared, and when the ulcer is once healed up no sign of the former process except the cicatrix will be found, unless an atonic ulcer is present, and thus a recurrence of the ulceration is not usual. Within a few days after the appearance of a syphilitic chancre the nearest, or next nearest, lymphatic glands are generally converted into indolent buboes, which may go on to suppuration should complications

occur; whereas in chancroid an enlargement of the lymphatic glands in the neighbourhood of the ulcer does not occur in the greater number of cases, but if it should take place it will increase quite rapidly to a suppurative lymphadenitis with frequently an inoculable pus. If the lymphatic vessels leading from the initial lesion of syphilis to the indolent buboes are also affected, they are converted into hard, knotty, painless cords, which quite frequently can be discovered only by the touch, and these sclerosed vessels pass frequently than the buboes proceed to the formation of pus within them; whereas the affections of the lymphatic vessels in chancroid, which is a less frequent accompaniment, presents t e picture of an acute lymphangitis, red stripes making their appearance in the skin, corresponding to which the painfully swollen lymphatic vessels are found in the deeper parts, suppuration being rare and the pus from the abscesses inoculable.

Should the chancre have an extragenital location, the difficulty may be considerably increased; but, as a rule, it is usually single and to be found in regions where chancroids are seldom or never observed, their almost invariable location being about the genitals. Such affections as herpetiform erosions of the lips, papules on the tip of the tongue, scarry ulcerations of the skin, scratches which refuse to heal, chronic inflammations at the tips of the fingers, resembling felons, but without the accompanying acute inflammatory symptoms, should be regarded with suspicion if indolent in course, obstinate in treatment, and accompanied by slight discharge which has a tendency to form crusts or false membranes on the eroded surface. If, moreover, such lesions are found upon an elastic, sharply circumscribed, indurated base, and are followed by hard, painless enlargement of the nearest anatomically related lymphatic glands the syphilitic probability becomes appromixated to a certainty. The possibility of chancre should receive suggestion in the presence of razor-cuts on the chin, cheek, or lips which, after having healed, reopen and become covered with crusts, pseudofuruncles or acneiform pustules, and cracks about the mouth or nose which persist, are painless, are surrounded by an area of inflammatory oedematous swelling, and give a thin and blood-stained discharge which exhibits a tendency to form crusts; in these cases the parotid and submaxillary lymphatic glands should be frequently and very carefully examined. When occurring on the scalp or on the bearded sheeks or chin, may closely simulate ecthyma. On removing the surrounding and covering hair, a glazed, flat, slightly elevated superficial ulceration is detected. It is not infrequently impossible for the local signs of such a lesion to diagnose the presence of syphilis. The syphilitic lesion begins as a papule or erosion, which slowly extends, is attended with considerable induration, is never actively inflammatory in type, causes painless enlargement and hardening of the nearest lymphatic glands, and is followed by secondary symptoms. The ecthymatous lesion begins as a flat pustule, surrounded by an acute inflammatory but non-indurated base, is generally multiple, and completes

its evolution in about a fortnight or three weeks. A chancre may make its appearance in the eyelids and the ocular conjunctiva, commencing as a papule, which gradually becomes indurated and eroded or ulcerated, presenting the characteristics of sloping edges and a hard base. The lesion is often mistaken for a stye; its development and the absence of acute inflammatory symptoms should make the diagnosis no longer doubtful after the lapse of a few days. The glands at the angle of the jaw and in front of the ear are the first to show adenopathic features. Chancres of the head and face have been known now and then to grow very large, differing entirely in appearance from syphilitic lesions elsewhere; induration may be absent, and occasionally acute inflammatory symptoms are observed. In such cases the development of secondary symptoms and the characteristic adenopathy will alone allow of a positive diagnosis. A chancre of the lip may simulate also other conditions of a non-specific sort. The lesion not infrequently begins as a chap or fissure, often occurring in the median line as an aphthous affection, an herpetic ulceration, or an ulceration such as would be produced by the burn of a cigar or cigarette. In the early stage there is nothing characteristic about these lesions, but in a few days the extension of the erosion or ulcer and the formation of a characteristic and usually very pronounced and extensive induration indicate the true nature of the trouble. In a week or a fortnight there will be enlargement of the lymphatic glands under the jaw and the specific nature of the sore becomes apparent forthwith. The congestion and the swelling produced may be so large as to cause the whole lip to attain an enormous size; and now and then the induration of the lip is so great and the ulcerating process so marked that at first sight a diagnosis of cancer may be suggested. But the two conditions may be differented by such diagnostic features as the following: In a chancre of the lip there will be the history of a risky coitus - in epithelioma of the lip perhaps a history of cancer in the family. A chancre occurs at any time, but a cancer nearly always after middle life. Chancre affects males and females indifferently; whereas the latter class seldom or never suffer from labial epithelioma. The chancre may occur on either the upper or the lower lip, whereas an epithelioma nearly always is found in the latter. In chancre there is a painless, elevated core, regular in outline, with a smooth surface and a sharply circumscribed, dense induration and a scanty and odourless discharge; in labial epithelioma there is an irregular, ragged, often painful sore, which bleeds easily, is irregularly indurated, and gives forth an offensive discharge. A chancre on the lips develops in a few weeks at most, often in from seven to ten days, and is followed in one or two weeks by submaxillary adenopathy, and by secondary syphilitic phenomena in from six to eight weeks; whereas in labial epithelioma the sore develops very slowly during a period of months, and it is long before the glands undergo enlargement. Under the microscope a chancre on the lip will show a small

round-celled infiltration, particularly along the course of the blood-vessels; whereas in a lip cancer pearly bodies are observed. Finally, it may be noted that a chancre soon takes its exit from the lip under the administration of mercury; whereas this drug is without effect on the cancrous condition. The tongue is less often affected with chancre than the lips; the anterior half of the organ is usually involved; the sore being either on the tip, the sides or the dorsum. The lesion is generally of the erosive form, and presents appearances similar to those of the genital lesion. The chancre is painless, oval or rounded, and superficial, with a smooth surface frequently covered with a grayish false membrane on a parchment-like induration. The lesion may be as large as a sixpence or a shilling, and the suprahyoidean and sometimes the submental glands are the first to show sympathetic enlargement, the latter group of glands when the tip of the organ is involved. An ulcerative chancre on the tongue shows a deep lesion, an inch or so in diameter, well-marked induration and sloping edges. It is usually easily recognised when well developed, but at an early stage is very often confounded with lesions of non-specific origin. As other persons may become infected, it is most important that the diagnosis be effected at the earliest possible date. If an ulceration apparently produced by carious teeth, or a papule arising without given cause, fails to heal in five or six days, but, on the contrary enlarges, becomes elevated, is eroded, is covered with a false membrane, and is not benefited by the application of astringents, etc., and especially should there be induration and adjoining adenopathy, the existence of syphilis is assured. It is quite rare to find a chancre on the tonsils or fauces; and in these situations the lesion is so masked by concomitant inflammatory phenomena that it is seldom diagnosed. It presents the appearance of a mucous patch, which is single, and, if it can be palpated by one finger in the pharynx and the other external to its walls, is found to be indurated. These patients show subsequent submaxillary adenopathy and have a definite history of exposure to infection. Tonsillar chancres are more common in women than in men. Mammary chancre is the result of the nursing of a syphilitic infant by a healthy woman, though under different conditions the lesion has been observed in the same region in the case of men. The chancre makes its appearance either about or upon the nipple, or upon the skin covering the mammary gland. In the latter case it usually exhibits the characteristic features of the initial syphilitic lesion as found upon the genitals, is easy to diagnose and usually of the erosive or ulcerative type. On the other hand, it is far from easy sometimes to diagnose a chancre on the nipple or at its base; for it closely simulates such non-specific affections as simple fissure, mechanical erosion or ulcer, or even incipient eczema. But should such a lesion, so simple apparently, instead of healing under treatment, slowly estend, if it is accompanied by little or no pain, if it gives a scanty and blood-stained discharge which has a tendency to crust, and, particularly, should it show distinct induration and

painless non-inflammatory axillary adenopathy, there is a syphilitic element present. The child being nursed should also be examined for evidences of the disease; for lesions of its mouth accounts for the chancres of the nurse, provided she is not its mother. Women more often than men show chancres of the anus; this is due not necessarily to unnatural practices, but rather to the fact that in the dorsal decubitus the vaginal discharges flow downward over the perinæum and the anus and inoculate cracks or abrasions thereabouts. The resulting chancre is usually seen at the margin of the anus, on one of the mucocutaneous folds or puckerings incident to the normal contraction of the external sphincter of the part. The ulceration frequently follows the line of these folds, thereby producing an elongated or linear lesion; this becomes indurated, gives a scanty discharge, is not painful, obstinately refuses to heal under local medication, and is followed by the distinctive adenopathy in usual course. Again, the anal lesion may assume the form of an excoriated papule, or of a typically cup-shaped densely indurated, ulcerating affection, though this is not so common. It is not infrequently difficult from the appearance of the chancre to tell whether it is a fissure, or a simple ulcer, or the primary lesion of syphilis. The diagnosis, however, becomes almost positive in the presence of a slow, progressive development of an anal lesion, and the absence of pain and spasm of the sphincter, even before the development of induration and adenopathy. Rectal chancres have only very occasionally been observed. Sometimes we find a chancre on one or other of the limbs. It may be observed on the thighs, the anterior surface in men and the posterior surface in women being the favourite sites; the lesion may also be seen on the antero-lateral surface of the forearm in both sexes, and particularly on the fingers at the margins of the nails. It has been known to develop over a knuckle, owing to inoculation of a crack or abrasion by a blow of the teeth of a syphilitic with mucous patches in the mouth. Limb chancres are, with the possible exception of digital ones, easy enough to recognise. Finger chancres usually make their appearance at the edges of the base of the nail, where they start as erosions, papules or pustules, which become indurated, elevated, and ulcerated, being accompanied by considerable swelling of the surrounding finger-pulp and looking very like an ulcerating felon. But the lesion develops slowly, gives rise to little or no pain, discharges inconsiderably, is not amenable to local medication, and is shortly followed by epithrochlear and axillary adenopathy. Should the chancre be on the ring or little finger, the gland at the elbow, if present, is enlarged; if located on the thumb or index or middle fingers, the axillary group will be first and solely enlarged. The patient may be unaware that he has contracted syphilis until the appearance of the secondary symptoms, owing to the insignificant and insidious development of the lesion, which may merely be a small hard pimple. It is very important, however, that the condition should be recognised early; otherwise healthy persons may become inadvertently infected. This is particularly true as regards doctors and midwives, who

are most often affected with the disease in this form. Vaccination chancre, as we have seen, used to be fairly common in the days when human lymph was employed for the operation. It is obviously very seldom seen nowadays. If the vaccination takes, the pustule may run the typical course, and may be healed before the appearance of the chancre. More often the healing of the ulcer resulting from the vaccinal suppuration is delayed; associated lymphatic glands begin to enlarge with the appearance of the chancre of one or other of the types already described. Should, however, the vaccination not take, there may be nothing unusual observed for a fortnight or a month or so. Then an indurated papule is formed, which slowly ulcerates and presents the usual signs of erosive or ulcerative syphilitic chancre. The diagnosis is confirmed by the beneficial effects of specific medication and the general history of the case.

SKIN.

General Considerations.

The syphilitic affections of the skin are known as SYPHILIDES, and are manifested in various forms. Preceding or ushering in the early eruptions there is sometimes considerable constitutional disturbance, such as slight fever, anorexia, muscular pains, and headache. In the vast majority of instances, however, general symptoms are wanting. Along with the cutaneous manifestations there are usually other signs of the disease. In the early eruptions the lymphatic glands are enlarged, and sore-throat and mucous patches may coexist. Sometimes there is concomitant loss of hair. In the later syphilodermata pains in the bones, osseous lesions, and other symptoms may be observed. The early eruptions are generalised; tha later manifestations are usually limited in extent, and have a tendency to appear in circular, semicircular, or crescentic forms. There are rarely any subjective symptoms. The colour of the established syphilides is a dull brownish-red or yellowish-red. These syphilodermata are not, however, found evenly distributed over the skin of the entire body from the very outset. The trunk is most usually affected, after that the scalp, and then one or other of the extremities; when the latter are attacked the thighs and arms are usually more affected than the legs and forearms, the flexor more than the extensor surface; consequently the palms and soles are the favourite sites of the early syphilides, tha backs of the hands and feet being at this time more rarely affected. In addition to these common locations there are others. Thus, in one patient the syphiloderm occupies by preference the anterior, in other the posterior half of the body; in one case the rash occupies only one area of the trunk, - having a decided resemblance to bilateral shingles, - while in another person it is confined more to the shoulder or more to the pelvic region; it is also by no means rare to encounter cases in which the eruption lies mainly on the upper or mainly on the lower half of the body. It is also important to note that these primary eruptions are located equally on the right and left sides of the body in the vast majority of instances, no matter in what way they are distributed. In less

common instances isolated eruptions occur from ten to twenty days before the full evolution of the syphilide, these being, as it were, the precursors of the fully-developed rash and consisting usually of one or more isolated pimples. In cases in which only very small quantities of the syphilitic poison pass into the blood-stream prior to the general invasion of the system, we may find dar-red patches of roseola, about the size of a florin, located on one side of the thorax and remaining unchanged for a considerable time, vanishing only along with the subsequent development of the general exanthem on the skin. The primary eruption may assume the form of a single symmetrically located rashes, but only in very rare cases. There seems good reason to believe that all forms of syphilodermata may simulate the non-specific dermatoses. Syphilides stand out more distinctly from the skin than do the common eruptions which they simulate and are more sharply defined, this being because they do not possess the inflammatory areola which so frequently surrounds the ordinary exanthems. Equally sharp demarcations of the diseased portions are, however, regularly found in ordinary skin troubles, and occasionally in erythema and other cutaneous effections, so that these may be very easily confounded with syphilodermata. The redness of the latter is vivid only in the early period; after it has existed for some time it fades to a dark bluish-red or dirty brownish-red and then remains stationary for some time. The older specific eruptions also are liable to remain stationary for some time, whereas in non-syphilitic skin eruptions a more rapid alteration in appearance is observed. The non-specific skin diseases are, with few exceptions, distributed symmetrically over the body, while only the earlier forms of syphilides observe a symmetrical distribution; the recurrent eruptions are especially noted for their asymmetry; while the grouped eruptions often present a serpiginous or circular or bow-shaped form. Certain areas of the skin in which non-specific exanthems often make their appearance are not the favourite sites of syphilodermata, and vice versa. The syphilitic eruptions, with the exception of some painful gummata, are usually not accompanied by itching, burning, or other unpleasant and annoying symptoms, unless they occur in places which are stretched or distorted with movements, or are macerated by natural or diseased secretions, so that the marks of scratching are seldom observed on or near them. Sometimes bleeding occurs in the neighbourhood of the syphilodermata. They are also not infrequently accompanied by lesions of the mucous membranes, which cannot be affirmed for the ordinary cutaneous troubles.

V a r i e t i e s .

ERYTHEMATOUS SYPHILIDE.

The erythematous syphilide (syn. Syphiloderma Erythematosum, Exanthematous Syphilide, Syphilis Cutanea Maculosa, Roseola Syphilitica, Macular Syphiloderm) occurs in the form of red spots from the size of a pinhead to that of a lentil or a fingernail, and is more or less elevated above the surface of the skin; the eruption

may appear at once as such or may be developed from evanescent, scarcely visible pinpoints or erythema. It is usually the first objective symptom of constitutional syphilis, gives rise to the least marked changes in the skin, and sometimes represents the preliminary stage of other efflorescences. In the first few days only a few spots are visible; but they increase rapidly and by the end of seven days they have generally reached their full number. The eruption consists not only of hyperaemia, but also of an infiltration of the tissues; for the redness does not always disappear on pressure, and the examining finger will often make out, even in those cases in which the spot is not visible above the level of the skin, a marked difference in consistence between the roseolar exanthem and the sound skin roundabout. The general features of the rash are not so marked in the case of individuals with deeply pigmented skin. The use of the microscope reveals that there is an increase in the nuclei of the capillaries; in the perivascular lymphatic species a copious cell formation and proliferation of the adventitial elements of the larger vessels which run towards the papillae, and proliferating connective-tissue corpuscles in the latter; also pigmented exudation cells and vegetations around the hair follicles, sebaceous follicles, and sweat glands. The term, maculopapular syphiloderm or syphilide has been applied to those cases in which the infiltration of the eruption is so great that most of the members of the efflorescence appear as broad, flat, erythematous elevations. This eruption may be observed in any part of the body, just as other syphilodermata may; but it is most often to be found on the trunk; when very profuse, it may be seen extending to the arms and thighs, and in still more extensive cases it may also occupy the forearms and legs, in which case the palmar surfaces of the hands and soles of the feet are usually also affected by the efflorescence. The backs of the hands and feet only very seldom show these roseolous spots. In exceptional cases, however, especially in persons of irregular life and in whom syphilis usually assumes a severe form, the roseola may be distributed over the entire body in such a way that there is nowhere, even on the head and face, any large area of unaffected skin; the backs of the hands, which usually remain immune, may even show an abundant crop of these spots. Sometimes this erythematous syphilide soon disappears of its own accord, even when untreated; but it generally persists for a long time and retains its colour for a week or fortnight; the infiltration then gradually subsides, its colour approaches more and more to the normal, passing through a dirty brown and dirty gray, until after three or four weeks more, the eruption will have entirely vanished, with no relics but those presently to be described. Nevertheless, in a few cases this eruption, instead of running its course in the average time of a few weeks or the extremely short period of only a few days, lasts for months; in that event distinct pigmentations will remain behind for some time on the site of the efflorescence, and some of them may even desquemate. At other times

the appearance of fresh crops of the erythema in new positions considerably prolongs the evolution of the exanthem. Despite the fact that this syphilioderm does not usually lead to other changes in the skin, even after it has existed for months, such sometimes do occur. Thus, here and there on the skin of the trunk there may be found groups of very small nodules which take the place of disappearing spots of roseola, and which, except for their dirty-brown colour, resemble the eruption of lichen scrofulosorum. If the erythematous eruption occurs in a locality rich in sweat glands, an increased secretion takes place from the latter; and this forms with the superficial layers of the epidermis a dirty brownish and scaly crust. The hairy scalp, especially its borders on the forehead and neck, the nasolabial fold, the chin, the external genitals, etc., usually show these fatty crusts of impetigo most distinctly. Should the eruption appear on the genitals and on parts where the secreted sebum is kept moist and becomes decomposed and so macerated and, - from the presence of pathogenic germs, - irritates the site of the efflorescence, - as in the case of the prepuce or on the vulva, - one may observe also a catarrhal condition, particularly a balanoposthitis or vulvitis. If the syphilitic erythema has already disappeared from the rest of the body, or there is a recurrent specific roseola which affects only the glans or the vulva, it may very easily be mistaken for simple, non-specific balanoposthitis or vulvitis. In cases of this kind in which the chancre has been overlooked, it may seem incomprehensible that symptoms with indisputable syphilitic characteristics should follow a gonorrhoeal inflammation of the glans penis. On close inspection of these cases, however, one will notice that while the diseased part, - for example the glans, - may be reddened over its entire surface; still, the accompanying erosions correspond mainly to the distinctly circumscribed flat infiltrations, and that the case is one of a syphilitic blenorrhoea of the glans penis with its secretion originating from the syphilides. In hairy localities loosening of the hairs takes place in the hair follicles, which is perhaps the result of an overproduction of the epithelial elements commencing in the sebaceous glands and extending to the root sheaths; and then one will notice a capillary congestion corresponding in area to the circumscribed skin lesions. This loss of hair usually occurs only on spots the size of a lentil to that of the tip of the finger; in exceptional instances these small areas of alopecia coalesce and form large patches quite devoid of hair. Such alopecia is generally observed on the head; but it may be seen in connection with the eyebrows, the axillae, and other hairy parts at different times or simultaneously. During the time that the eruption is ripe other lesions may be observed, individual macules showing in their centre smaller or larger infiltrations, forming nodules or papules, a few of which persist and may outlive the macular syphilide by some weeks. These papules are most often seen in the axilla, the bend of the elbow, under the breasts, at the umbilicus, on the external genitals, in the groin or in the popliteal space; but they may make their appear-

ance on any part of the body. This syphilitic erythema is not infrequently accompanied by mucous-membrane lesions and a general swelling of the lymphatic glands; in rarer instances one may observe slight meningeal and articular affections, periostitis, iritis, infiltration of the testicle, enlargement of the spleen, and troubles in other organs. Epileptic attacks have now and then also been observed. In the absence of such complications as these, the eruption, except when ripe, often escapes the attention of both the patient and his medical attendant and gives rise to very little or no inconvenience. It sometimes happens that a recurrence of the syphilitic roseola is observed; these recurrent eruptions may be exactly similar to the first one, but usually the individual macules are larger, livid, and more markedly infiltrated than those of the first attack, and sometimes they are mainly located on the shoulders and the anterior or posterior folds of the axillae. In certain instances involution, which is usually slow, commences in the centre of the patch, and circular lesions, called syphilis annularis or roseola annularis, remain, which, spreading out at the periphery and healing at the centre, form wider and wider circles, and where they overlap give rise to the peculiar appearances known as roseola serpiginosa, gyrata, and figurata. It not infrequently happens that it is only in single , asymmetrically distributed and often squamous lesions that these recurrences, which make their appearance many months or one or two years after infection, are observed. The diagnosis of syphilitic roseola is considerably simplified by the presence of concomitant evidences of the disease, particularly the chancre, the indolent buboes, and so forth. The affection may be simulated by simple erythema and the copaiba eruption. The former, however, is not associated with a history of chancre or with the signs of early secondary syphilis, is more commonly accompanied by distinct fever and digestive troubles; it itches, and develops and subsides in a short time, having no tendency to pigmentation or persistence, The eruption due to the ingestion of copaiba often shows large itching and confluent patches, which run their course in a few days, and appear with special intensity on certain regions, such as the extensor surfaces of the joints, subsiding promptly on the stopping of the exhibition of the drug. Further, there is a history of its administration, and in cases in which this is denied urinalysis gives the usual reactions of the medicament. A temporary or permanent angioneurosis sometimes gives rise to a dilatation of the smallest vessels in the skin, with the result that one observes bluish spots covering larger or smaller areas, or a wine-red network, cutis marmorata livida. But there is no infiltration about these spots; and if they are due to the action of cold they will vanish in an equable temperature; if the angioneurosis is permanent, however, the markings will remain, but there will be no evidence of progression or retrogression such as obtains in syphilitic eruptions. Individuals who are troubled with pediculi pubis may show on the trunk or the thighs steel-blue maculae from the

size of a lentil to that of a glove button, which may very easily be mistaken for the lesion of syphilitic roseola. These spots, known as taches bleues, appear to be a kind of toxic erythema, caused by the secretion of the pediculus pubis. Not infrequently it is possible to discover the eggs or nits adhering to the young hairs in the region of these spots, and the recognition of the condition should be easy on detection of the parasite itself on the pubes or elsewhere. The differentiation of erythema iris and annulars from syphilitic erythema should occasion no difficulty either; for the former is situated chiefly on the backs of the hands and feet, localities which generally remain free in the syphilitic eruption, and even without special medication, the erythema vanishes entirely in a fortnight or so. Some confusion may arise from the presence of recurrent syphilitic roseola in the form of plaques, rings, or convolutions accompanied by only slight desquamation, the condition being not infrequently mistaken for tinea circinata tonsurans; but the true nature of the lesion should become apparent from the discovery of the trichophyton in the scales and hair. The varioloid blush may also cause confusion, but the history of the case and general evolution of the disease should allay all difficulty in due course. The eruption of measles, German measles, and the like affections should not be confounded with syphilitic roseola when we remember that very high temperature is present or precedes the acute exanthemata, even in their lighter forms; that the eruption is especially marked in those localities, - the head and face, - where the syphilitic eruption does not generally occur; that there are acute mucous-membrane lesions; and that the individual spots are located in the midst of large hyperaemic areas of integument.

PAPULAR SYPHILIDE.

The papular syphilide (syn. Syphiloderma Papulosum, Syphilis Papulosa, Syphilis Cutanea Papulosa, Papular Syphiloderm) may sometimes be an outcome of the form of lesion described above by increasing infiltration; it not infrequently follows a roseola, and now and then any of the cutaneous lesions of the primary exanthem may assume a papular form, the papular syphilide being the first expression of the constitutional infection. A slight eruptive fever may usher in the papular syphiloderm. A day or two later, hyperaemic spots from the size of a pinhead to that of a lentil make their appearance over the whole body, lying close together in certain localities and coalescing so as to form an extensive erythema. These show after a few days infiltrations, papules, of a pointed semiglobular or flat form, raised above the level of the skin, ranging in size from a mustard-seed to a pea or larger. In certain cases, too, no precursory hyperaemia or other cutaneous lesion may be observed. The microscope shows the lesions to be due to a new-cell infiltration arising from the connective tissue, but especially from the walls of the vessels, which is present not only in the papillary later, but also in the deeper layers of the skin, and even extends into the

subcutaneous connective tissue. Often this new growth is found to be most dense in the neighbourhood of the hair follicles and of the sebaceous and sweat glands. There may be an arteritis obliterans, and pigment will be found in the upper layers of the skin. Not infrequently these glandular formations remain unchanged for a considerable time. The greater the infiltration the more will the newly formed cells also penetrate into the stratum Malpighii and will finally obliterate the boundary line between the latter and the papillae; in a much greater degree the newly formed cells will have wholly replaced the rete Malpighii and extended to the free surface. This is obviously the first step of a process of disintegration due probably to the arteritis obliterans. The lesions are small or large and termed according to size either the SMALL PAPULAR SYPHILIDE (Syn.: Miliary Papular Syphilide or Syphiloderm, Lichen Syphiliticus) or the LARGE PAPULAR SYPHILIDE (Syn.: Lenticular Papular Papular Syphilide). The larger eruptions appear at once of full size, or else they are formed in the course of time from the smaller lesions, or they are developed from the roseolar spots. In some cases these lesions undergo various other modifications. The colour of the lesion is infrequently bright-red, and then only during the first few days, later a mixed shade of dark-blue or dark-brown being observed. Sometimes the eruption may become so pale that it differs only very slightly from its surroundings. The further development of the papule is variable, according as it is situated in a dry region or in one which, by reason of its anatomical conditions, is moist and warm. Thus, one may find, in most parts of the trunk, on the extensor surfaces of the limbs, and in other dry localities, that the papules do not grow larger than the size of a pinhead or a lentil, in general not larger than a pea, and that the spots are dry and but slightly scaly. Forthwith on the commencement of involution the red colour and the infiltration of the papule disappear, and desquamation also takes place in the surface of the lesion; the papule in this way becomes smaller and smaller, until it seems after a week or two to have been entirely absorbed, and the round place where the papule had existed is now marked only by slight desquamation. Gradually this also disappears, and every trace of a former affection is then gone. Should, however, infiltration and hyperaemia persist for a longer period, there may be, in addition to the desquamation, a dirty bluish-red, reddish-brown, or gray discoloration, and in this case it is quite probable that the colouring matter of the blood has been transuded into the hyperaemic tissues and become deposited there, where it is changed into pigment. Under such circumstances it is possible, for a long time after the papule has been entirely absorbed and when desquamation has also ceased, to recognise a dark blue to gray spot of pigment at the point where the papule had been. This pigment will, however, also be absorbed in a few weeks, the absorption extending even to the normal pigment of the stratum Malpighii of this location, which will then present an entire absence of pigment and indicate the former presence of the papule

for months or years as a light spot. The lenticular papular syphilide is perhaps the most common of all, and it runs a comparatively benign course. It is generally symmetrically distributed over the above-mentioned localities, and to an early recurrence or general infection of the system bears first witness. It vanishes in a few weeks, though the individual members of the eruption may attain a considerable size and last for perhaps months in neglected cases. Sometimes syphilis first manifests itself in the form of only few very large papules, from the size of a pea to that of a bean, - giant papules, - of the colour of a biscuit or the crust of bread, which evolve quite irregularly on the forehead, the hairy scalp or the face, or are scattered here and there over the trunk and on the extremities. Such single giant papules, appearing as the first symptom of a general infection, are of not very favourable omen as regards the further course of the disease. Still more serious would be the occurrence of the small papular or miliary papular syphilide, the lichen syphiliticus. In this lesion the papules are of a dirty brownish-red appearance, hardly reach the size of a millet-seed, and are diffusely scattered over large portions of the trunk or of the limbs, or are aggregated together in groups; as a rule, they persist for a long time, generally much longer than the lenticular papules. Their absorption is usually accompanied by atrophy of the skin, so that after the healing of the small nodular syphilide a shallow punctiform cicatrix is left behind. The small papular syphilide occasionally initiates the general infection; sometimes it appears with the macular syphilide, in such a manner that miliary papules make their appearance within the borders of large roseola plaques; or it takes the place of a recurring eruption, in which case the efflorescences occur partly in the manner described above, partly in the form of circles or crescents, - serpigines. Individual lenticular papules, together with a copious eruption of lichen syphiliticus, may sometimes beobserved. The mucous membrane may sometimes also show the presence of papules, though only rarely in a miliary form. In most cases individuals who show the miliary papular syphilide are in bad health, having considerable pallor, nutritional disturbances, and a tuberculous dyscrasia, - so that syphilitic lesions of other organs of severe type are generally seen at the same time. At the tip of a papule a more acute exudation, manifested by a very small vesicle or pustule, may be seen. It is sometimes termed the vesicular syphilide, or herpes syphiliticus when the spots of this eruption are close together. The usual happening is for the contents of the vesicle to dry up and become converted into a small scab, and in this way impetigines are formed; these are most often found in the hairy scalp, on the face, on the lower limbs, there constituting syphilitic papulocrustoses or papulopustuloses. Despite the fact that efflorescences somewhat similar to those of eczema are formed, it would be incorrect to speak of a syphilitic eczema, and for the reasonthat further inoculation after the fall of the little scab is carried on as mentioned above,

which does not obtain in ordinary eczema with its intense itching absent in this disease. It sometimes happens that thesyphilitic papule becomes haemorrhagic. It is of serious import, as a rule, on account of the probability of there being coincident bleedings into various vital organs. Desquamation is to a greater or lesser extent observed in connection with all the papular syphilides; but in some cases this may be so marked as to give the disease a distinctly squamous type; to it the name of papulosquamous syphilide has been very aptly described. Sometimes the squamous character predominates, so that a squamous syphilide is recognised by certain dermatologists. In certain instances one may come across an eruption rather like that of psoriasis vulgaris. The spots, distributed more or less evenly over the whole body, of variable size, and occasionally healing in the centre, are situated on a very slight infiltrated and reddened base, and are covered only by a thin layer of small and pale brownish scales; they can therefore be easily distinguished from ordinary psoriasis. The condition is that of a syphilide which in all probability has been from the first of a squamous form; and these cases being usually in existence for many years before they are first seen, there is every probability that the squamous form has been preceded by the papular. Variations in form of the papules are influenced by the site of the lesions. Only in exceptional instances are the palms and soles the seat of elevated papules; these parts generally show nothing but a circumscribed erythema, and almost perfectly flat infiltrations, of the size of a lentil or a little larger, and little or no elevation of the lesion above the level of the surrounding skin. On the disappearance of the erythema and the infiltration the occurrence of desquamation is noticed. The respective parts are then slightly reddened, their infiltration being recognised by the touch; they are most conspicuous from that fact that they are covered in the early period by a dense adherent horny epithelium, which sooner or later forms white scales; after persisting for some time, these fall off, and leave behind them a fine, rosy skin,which is surrounded by a border of scales which are adherent at their centre and raised at the edges; these eruptions attain various dimensions and desquamation of the old and accumulation of new scales alternately are on them often noticed. Sometimes the constitutional involvement of syphilis is primarily expressed by the development of papules on the palms and soles, with syphilides on the rest of the body at an early date. Not infrequently these palmar and plantar syphilodermata relapse, and the lesions are occasionally seen in crescentic forms. The papules seldom occupy only one palmar or one plantar surface; most often both palmar or both plantar surfaces are affected simultaneously with involvement of both hands and both feet. The favourite sites of the papules are the grooves on the flexor surfaces of the fingers, the inner concave portion of the soles, and sometimes the lateral or upper border

of the heel; the distensibility of these parts of the skin on the one hand, and the brittleness caused by the infiltration and accumulation of scales on the other, afford an explanation of the fact that the affection is often accompanied by rhagades and fissures and are consequently very painful. When the palmar syphilide is very extensive, and the changes extend also to the volar surface of the fingers and to the nail furrows, causing the nails to become fissured, full, and deformed. Now and then, even after the lapse of years, thickened portions of skin with a horny, frequently noticed, epithelial layer make their appearance in individual portions of the palmar surface of the hands or the plantar surface of the feet, of the size of a pinhead to that of a lentil; or there may be only slight desquamation of a somewhat thickened cutis on the fingers and hands. Brownish-red discoloration is generally left after the cure of a chronic palmar syphiloderm. The special construction of the palms and soles makes it understandable why the syphilides of these regions only slowly pass through its stages of evolution and involution, and why the process of desquamation lasts for a long time after the healing of the other syphilitic products, and also explains the application of the term psoriasis palmaris in connection with it. Often the palmar and plantar syphilis is, indeed, the only symptoms of syphilis present; sometimes even the existence of the taint is made apparent by the presence of a single spot on the border of the nail, or perhaps elsewhere on the fingers, of the size of a pinhead to that of a lentil, and horny or desquamating. When the papular infiltration occurs at the edge of the heel, or on some other part of the plantar surface of the foot which is covered with a thick layer of epithelium, as on the ball of the great toe, a peculiar appearance is produced. The skin here presents itself, not only where the papule is located, but also over a larger area, thickened like a callus, this thickening gradually becoming less towards the outer side. The desquamation begins at the centre, so that after maceration and removal of the horny layer the circumference of the papule, still covered with an epithelial layer, can be recognised quite distinctly. In the course of the process the border of the peripheral callus ring which is immediately contiguous to the papular infiltration is lifted from its base, not, however, separating itself altogether; The lesion then resembles a gradually rising hill, resting on a broad base in whose crater-like depression a plug, having at times a smooth, at times a warty surface, is seen. The whole trouble, indeed, reminds one of an incipient perforating ulcer. If neglected, disintegration of the infiltration occurs from the pressure of the callus; the ulcer thus formed shows only a slight inclination to heal, on account of the callus border, and tends rather to increase in area and depth. It is a long time, even with proper treatment, before all the horny layer is removed and the

infiltration is perfectly absorbed. One may observe similar changes of the papule when it is situated in the palm. Unusual forms of papule may occasionally also be seen on the face, especially on the chin and at the nasolabial fold, or on portions covered with hair, at the border of the scalp, sometimes also at the anus and genitals, that is to say, usually on parts rich in follicles. Here very large and succulent papules occasionally make their appearance, which are covered with sebaceous scales or scabs, after the removal of which the surface will be found covered with numerous papillary formation or papules of an exuberant framboesia-like character. When occurring on those portions of the skin which, on account of their anatomical situation, are frequently moistened by physiological secretions or soiled with pathological excretion, dirt, and so forth, the papules undergo certain modifications; such situations are the external genitals, the genitocrural folds, the perineum, the region of the anus, the umbilicus, the axilla, other parts of the skin which become macerated by contact, those which are in contact with other cutaneous surfaces, - such as the skin of the chest covered with pendulous breasts and the interstices of the toes, - or parts where other conditions lead to suppuration, as the furrow of the nail in cases of ingrowing toe-nail, the external auditory canal in otorrhoea, and, finally, all parts covered with tender epithelium which may become irritated in the same manner, as the nipple in nursing, or any portion of the skin which is soiled with urine or faeces, especially in children who are not kept scrupulously clean. The papular eruptions which make their appearance under these conditions will undoubtedly become speedily macerated and denuded of their epithelial covering, and therefore continually present a moist surface: hence the terms wet or moist papules, papulae humidae, plaques muqueuses, tubercles muqueux, etc., which have been applied to them. They grow very luxuriously, on account of the fostering moisture and warmth of their favourite locations; for while the dry papule reaches the size of a millet-seed or lentil, and usually do not grow larger than a pea, the moist papule attains the size of a shilling or even larger. Its free surface is slightly spherical or quite flat, and the papule is attached throughout the whole circumference of its base. It has by reason of the above-mentioned characteristics been termed the broad, flat or shallow papule; these lesions are also cometimes called condylomata lata. The enlarged papule rises abruptly above the surrounding level, it is sometimes more, sometimes less red, succulent and soft, and after it has existed for some time it often presents a bluish colour, as though desquamated, or else the macerated epidermal layer is very soon thrown off, and the tips of the papillae rise as red points above the whitish interpapillary remnants of epithelium, having a raspberry appearance, excreting a large amount of stinking pus and constituting thus the pustula foeda of the earlier writers on the disease. Such parts of the integument of the body are kept moist and warm over

a wide extent of surface and which are at the time soiled in careless persons, expecially by dirt, such as the genital region, the anus, and their vicinity, will therefore be densely covered with these moist papules, so that the efflorescences overlap each other, leaving no normal skin whatever between them. Only at the edge of such a diseased area is it possible to recognise some individual rashes; farther on towards the centre the moist papules become flattened against themselves, so that a longitudinal or much facetted, succulent cushion covered with greasy pus is formed, in place of the flattened round formation; this is especially the case when the papules densely cover the labia minora, the perineal raphe, or other furrows covered in by the neighbouring parts. The papules surrounding the anus are usually continued in swollen folds which spread around the anal orifice, assuming the shape of a leaf. In proportion as the moist skin merges into the dry, the eruption becomes less densely packed, and one observes only single patches on the perfectly dry portions, which become smaller and less numerous the farther they are situated from the moist portions, and gradually assume the features of the dry papules. But in such cases as the papule remains moist a firmly adherent deposit occasionally forms on its surface, which breaks down and thus leads to a loss of substance. By a continued renewal of the deposit and its repeated breaking down, an ulcer is formed which, extending deeper and deeper, may involve gradually the whole papule, even the base on which it stands. This is the ulcerated papule or syphilitic ulcer, which has taken the place of the papule. In most instances the loss of substance in such an ulcer is confined to the area occupied by the papule, and involves at the most the whole thickness of the skin in this area. It is only in the most neglected cases that one encounters a wider destruction on the surface, or into the deeper tissues, as a result of such an ulcerated papule. Usually the ulcer clears up and cicatrisation then commences. Should the parts which are naturally moist be kept dry, the purulent secretion of the free surface becomes less, maceration of the newly formed epithelium does not take place, and the latter is then thrown off in the form of scales of a small size, as in the case of the dry papule, and healing occurs in the already-mentioned way. In exceptional instances untreated papules in careless and dirty individuals dry up and harden into flat, firm nodules of the same or a somewhat darker hue than the surrounding skin, and persist as permanently organised formations; in the dry papules this is even more rarely the case. Consequently the genital region of the anus, and other localities which are the favourite sites of moist papules are more likely to show these permanent organised papules, seldom, however, the angles of the mouth and other parts. The fact that lesions of the same form are not infrequently found in various stages of progression or retrogression still further contributes to the great variety in the appearance of the papular syphiloderm, which, it has been shown above, when it makes its appearance on the skin extensively

may assume various forms, according as the lesions are dry and scaly, as on the trunk, or covered with scabs, as on the head, or weeping and moist and very closely crowded together, as on the genitals and the anus, or else quite flat and readily scaling, at times covered by a horny layer, as on the soles and palms. It should also be borne in mind that macular lesions may coexist with papules, and in this way the variability in form of the syphilides of this disease is still further enhanced. Papular syphilides are seldom seen on the backs of the hands and feet or on the extensor surfaces of the limbs; but even with these exceptions an eruption of this symphilide covering the whole body occurs only during the first stage of the disease, at which time, moreover, a symmetrical distribution is very common. The favourite sites of the papules are the trunk, the face, especially the chin and nasolabial fold, the scalp, particularly at its margin, - corona verneris,- the genitals and the parts around, the perineum and anus, the umbilical depression, the axillae, the flexor surfaces of the hips, elbows and knees, the palmar and plantar surfaces, and the interstices between the toes; in some persons there is a copious eruption of papules on the neck, especially the back thereof. The lesions are, however, also encountered in other situations, as the ungual furrow, the lids, the external auditory canal, etc.; also other parts, which are exposed to a more or less constant irritation, such as the forehead which is pressed on by the rim of a stiff hat, the bridge of the nose which is pinched by eyeglasses, or any part of the skin which is irritated by dirt, etc., may in rare instances suffer with this eruption. Though sometimes occupying several months, the papular syphiloderm generally vanished in a few weeks. Certain forms of this skin eruption, such as the weeping papules and those situated on the palms and soles, frequently persist long after all other lesions have disappeared; at other times the process is apparently prolonged by the development elsewhere of fresh efflorescences of slow evolution, while the first crop vanishes. The fact that the syphilitic moist papule, especially noticeable as regards its contagiosity, is one of the commonest of the relapsing lesions renders it especially serious as regards healthy individuals brought into contact with the patient. An eruptible fever usually precedes the first relapses of the papular syphiloderm, and the eruptions are very similar to the first efflorescence; the later the occurrence is observed, however, the less numerous are the lesions, and it often happens that the recurring syphilis is represented only by a single moist papule, or a single desquamating or callous area on the palm of the hand or the flexor surface of one of the fingers. Now and then one may encounter one or two lentil- or button-sized papules, of round or elliptical shape raised at the edges like a wall, the centre being either covered with normal skin or depressed and hidden by a small scaly scab. The fewer the recurring nodules the less symmetrical are they and the more they tend to be grouped together in one place, where it is not unusual to find them arranged in circular or semicircular shape. Often these groups of

papules spread out at their periphery, while the older lesions in the centre of the group are absorbed; in this way the affection progresses excentrically, while at the centre the relics of a former efflorescence will not infrequently be observed in the form of desquamation, pigmentation or blanching. It is common enough to come across only a single group of papules arranged in circular or semicircular form; they may form various curved figures of serpigines when several individuals form in proximity to one another. Little or no inconvenience is felt by the patient, as a rule, from the presence of the dry syphilitic papule; only during thestage of desquamation may a slight itching be complained of. The moist papules are much more irritating, as they generally itch and burn, and the resulting fissures and excoriations, especially when near the anus, may become the cause of considerable and almost continuous pain. The patient may become almost a cripple from the presence of fissures of the hands and feet or psoriasis of these parts. The chancre or its relics may not infrequently by observed in addition to the papules. Baldness, coincident mucous-membrane, oral , nasal, pharyngeal, and paryngeal affections, as well as symptoms of meningeal irritation, visual troubles, and adenopathy often coexist with this syphilide; neuralgia, facial paresis, and other serious nervous phenomena have also been noted. Not rarely articular and osseous and muscular affections, lesions of the tendon sheaths and of the synovial membranes and gummata of the integument and other parts have been reported. The diagnosis of the papular syphilides can usually be effected with tolerable facility on application of the above-mentioned facts, particularly the various locations of the trouble, the peculiarity of the efflorescence according to its location, the chronicity of its evolution, and such other facts as the possible concomitance of a chancre, the adenopathy of the disease, and syphilisation of other organs. When the syphilide continues for long to desquamate and when there is a considerable accumulation of scales, such affections as ringworm and psoriasis may be the case. Venereal warts can usually be distinguished by a careful investigation of the clinical features and the history of the illness.

VESICULAR SYPHILIDE.

The vesicular syphilide (Syn.: Syphiloderma Vesiculosum, Syphilis Cutanea Vesiculosa) is an exceedingly rare form of cutaneous syphilis, and in the great majority of cases may be more properly classed under the pustular variety. In its effects upon the skin it may closely simulate any of the non-syphilitic vesicular affections. It has therefore been recognised as occurring in such forms as the eczematous, the varicelloid, and the herpetic. The lesions vary in size from a pinhead to a split-pea. If small, they are more or less acuminated, disseminated or grouped, usually involving the hair follicles; if large, semiglobular or flat, with or without a tendency to umbilication. The vesicles, as a rule, pass into pustules. It is an early eruption, occurring usually within the first six or eight months; it is rarely extensive, pursues a rapid course, and is usually

associated with other symptoms of the disease. The first variety, the eczematous, appears as a general eruption of small vesicles, either discrete or in patches, and generally avoiding the face. When the vesicles are discreet, each is surrounded by a characteristic areola of a ham-red colour. If the fluid contents of the vesicles remain clear, it may break through its thin epidermic wall and escape, or may be reabsorbed, leaving only a slight epidermic exfoliation and temporary pigmentation; often, however, pustulation occurs, and thin yellow impetiginous crusts are formed. This last form is commonly associated with papular and pustular eruptions on other parts of the body, and is apt to prefer a location on the face and about the external genitals. The presence of other syphilitic symptoms, the beneficial effect of mercurial medication, the absence of itching and of acute inflammatory signs, and the characteristic areola will allow of the differentiation from vesicular eczema. The second variety, the varicelloid, evolves as a large, not very numerous, discrete, split-pea-sized vesicles, either globular or umbilicated, which persist for some time, and then rupture, leaving an aera of slight crusting and pigmentation; they may show smallpox-like pustules and cupstations. The base of each vesicle is surrounded by a characteristic coppery areola, and other syphilodermata are generally present. The history of the case and the concomitant syphilitic constitutional phenomena should easily distinguish the lesion from smallpox or chickenpox. The last-mentioned variety, the herpetic, makes its appearance in the form of clusters of vesicles of various sizes, either irregularly grouped or arranged in a decided circinate manner. The lesions of the circinate form are small, of short duration, and dry up without breaking, and leave behind them a ham-red pigmentation and an area of superficial exfoliation. The diagnosis from herpes is usually easy, though there are cases which in the absence of associated syphilitic symptoms the recognition would be well-nigh impossible.

PUSTULAR SYPHILIDE.

The pustular syphilide (Syn.: Syphiloderma Upstulosum, Syphilis Cutanea Pustulosa) is an important manifestation, although not so common as the macular and papular varieties. The lesions assume one of several forms, - small or large pustules, either of these acuminated or flat, - although not infrequently they are intermingled. It is the usual thing to find the lesions lying on indurated coppery bases, with a large dusky areola surrounding them. At a late stage deep ulcers may be formed, but the early first-appearing eruptions have their pus contained between the elevated epiderm and the true skin. They may very closely simulate any of the non-syphilitic pustular eruptions. They are prone to crust, the crusts varying from a dark-yellow to a dark-green or brown-black colour, and reveal a distinct punched-out ulcer, covered with viscid pus, when raised from the surface of the lesion. On healing they leave marked pigmentations, and permanent scars in cases that are not purely superficial. Pustules commonly appear late in the disease; severe forms of syphilis are generally associated with their early development.

The lesions may make their appearance on any cutaneous surface; they are more often to be found on the legs, the face,and the scalp when few in number. Any of the syphilodermata may be discovered in association with pustular lesions, and even when the predominant eruption is papular the pustule may be found at the same time and in all its forms and at all stages of evolution. An early pustular eruption is especially liable to be preceded by syphilitic fever of an intermittent type, and its associated symptoms of malaise, pallor, mental abstraction, headache, insomnia, joint pains, pectoral pains, and so forth. The lesions are somewhat intractable, are apt to recur, and are more often followed by tertiary manifestations than when the eruption appears in a macular or papular form. A marked tendency to suppuration is observed in connection with the tubercular and gummatous lesions of the tertiary stage when pustulation has been unusually prominent during the secondary period of the disease. The small acuminated pustular syphilide (Syn.:miliary pustular syphilide or syphiloderm) is the most superficial eruption of this class and the earliest of them to appear. It consists of minute miliary pustules, each situated about a hair-follicle or the opening of a sebaceous gland. It is followed by the formation of small yellowish crusts, leaving a pigmented spot surrounded by a fringe of exfoliating epithelium. On its first appearance the eruption generally covers a large surface, may be discrete or confluent, and shows circinate grouping. Relapses of this syphiloderm tend to group in certain parts of the body and not to manifest themselves as a generalised efflorescence. In confluent cases superficial scabs are formed very like those seen in impetigo. The rash about the lips is sometimes accompanied by a warty growth. This efflorescence corresponds closely to the small vesicular syphilide, the only difference being that the raised epidermis has beneath it serum instead of pus. This eruption does not last for any considerable period. Slight crusting occurs, and a pigmented spot is left which is slow to disappear. A permanent scar is left when ,as sometimes occurs, especially in relapses, ulceration takes place. The diagnosis is rarely difficult, and depends upon the pigmentation, and particularly the fact that papules and syphilitic erythema are usually in association with it. The large acuminated pustular syphilide (Syn.: Acneform syphilide or syphiloderm, acne syphilitica, varioloid syphilide) is either of a sudden development or of slow evolution with coincident fever. When the pustules are moderate in size, they so closely resemble ordinary acne that the term syphilitic acne is very generally employed to designate them. The individual lesion begins as a macule, which quickly becomes converted into a pustule, commonly placed about a hair follicle, upon a papular, infiltrated, coppery base. The pustule remains for one or two weeks before bursting. Then crusts are formed, which in dropping off expose either a superficial ulcer, or, more usually, a coppery papule. This and the pigmentation very slowly disappear, and a

scar is usually left behind. The lesions may appear as a general efflorescence; but more often the scalp, the face, and the trunk are invaded, with not infrequently a localisation on the limbs. In subacute and relapsing cases the eruption is apt to be localised. It pursues a rapid and usually a benign course, and is to be distinguished from acne, from the potassium iodide eruption, and from smallpox. Its recognition will mainly depend on the presence of other signs of syphilis, particularly the other syphilodermata. The usual limitation of acne lesions to the face and shoulders, their rapid formation, and the chronic character of the disease, together with the absence of the concomitant symptoms of syphilis, are points which are useful in the diagnosis. Smallpox differs in the intensity of the general symptoms, the umbilicated pustules, and the definite duration of the disease. The acute character, bright colour, course, and history of potassium iodide eruptions are generally sufficiently characteristic. The small flat pustular syphilide (Syn.: impetigo-form syphilide or syphiloderm, impetigo syphilitica) is a form of syphilitic efflorescence which bears a marked resemblance to the lesions of impetigo. They are more common than the acuminated syphilodermata. Small, flat, split-pea-shaped pustules form on somewhat elevated coppery bases. These pustules slowly rupture, are are followed by rather thick, adherent, yellowish or greenish crusts. The lesions may be discrete, may exhibit a circinate grouping, or may be confluent, forming irregularly shaped crusts, - pustulo-crustaceous. In the latter periods of the disease this eruption commonly appears in the form of irregular patches, often representing a narrowed crusted circinate border, which, spreading peripherally, encloses an area of pigmented, scarred, or normal integument. Ulcers are to be found beneath the crusts of syphilitic impetigo. They may be superficial or deep, the latter variety appearing late in the disease. These ulcers on healing leave depressed, pigmented cicatrices, which are prone to scale for months. The cicatrix remains white after the pigmentation has finally disappeared. The efflorescence may last only for a few weeks when it is of early appearance, but a very chronic course pursued by the late confluent circinate and serpiginous varieties. The lesions are very commonly situated on the face, especially the hairy portions, as the beard and the eyebrows, and about the nostrils and lips. They are also not infrequently to be found on the scalp, the chest, and the outer surfaces of the arms and legs. When upon the scalp the efflorescence is apt to resemble pustular eczema and impetigo, from which it cannot be distinguished by inspection alone. Underneath the crusts of pustular eczema there is an excoriation, as well as more signs of inflammatory reaction than in the syphilide. The pustule in impetigo is discrete, not situated on an infiltrated base, and has not coppery areola. The associated symptoms of syphilis are of great importance in making the diagnosis between this and any other simulating lesions. The large flat pustular syphilide (Syn.: ecthyma-form syphilide or

syphiloderm, ecthyma syphiliticum) has a marked resemblance to ecthyma, which fact accounts for the name syphilitic ecthyma which has been very generally applied to it. The efflorescence appears in the form of large, flat pustules, varying from a quarter of an inch to an inch and a half in diameter. The lesion usually begins as a raised, dusky-red, slightly inflamed and indurated area, which quickly suppurates, the pus raising the epidermis only a little, and forming a large, flat, not very tense, and quickly crusting pustule. The affection may remain superficial, limited, and only moderately crusted, exposing, on exfoliation or removal of the scab, an erosion or a shallow ulceration, or both in depth and circumference an extension may be observed. The superficial form occurs towards the end of the first year of the constitutional infection; it is amenable to specific medication, and is most commonly seen upon the shoulders, the back, and the limbs. The ulcerative process progresses in all directions in the deep form of syphilitic ecthyma. The crust increases in thickness and extent, the material for it being furnished in the continued suppuration of the extending ulcer; it projects from the surface in the form of a greenish or brown-black cone, often exhibiting distinct stratification. This thick, conical, adherent crust commonly overlaps the raw surface beneath; sometimes its base is sunk in the ulcer and completely surrounded by unhealthy granulations. The term rupia has been applied to lesions made up of these dark, raised, conical, laminated crusts, seated upon deep ulcers, and surrounded by reddened, indurated areas. When the ulceration extends laterally and does not grow materially deeper, the crust may be depressed in the centre and elevated about the margins. When the thick crusts of deep ecthyma are removed, punched-out ulcers covered with thick greenish or yellow pus are found. These ulcers are round or circular, and usually discrete and few in number. When the pustules are closely grouped they commonly become confluent, the outline of the resultant lesion being circinate. The chronic crusted lesions of the pustular syphilides are termed pustulo-crustaceous; they are called serpiginous when they are confluent and spread widely in circinate and destructive forms. Syphilitic ecthyma must be distinguished from simple ecthyma mainly by the evolution of the lesions, which in non-specific diseases develop rapidly and run their course in a few weeks, are attended with heat, pain, and other symptoms of acute inflammation, form brownish, not very thick laminated crusts, and show on removal of the latter superficial ulceration in place of the punched-out unhealthy ulcer of syphilis. In ecthyma the eruption is uniform, and there are no concomitant syphilitic manifestations. There are no permanent scars left behind after an attack of deep ecthyma. Rupial and the other forms of deep syphilitic ecthyma appear late in the course of syphilis. Specific medication slowly heals up the late pustular efflorescences, particularly those which are deep. They usually make their appearance in the cachectic and ill-fed. The lesion is very common in both hospital and dispensary practice.

PIGMENTARY SYPHILIDE.

The pigmentary syphilide (Syn.: leucoderma syphiliticum), as its name implies, is characterised by pigmentation. It not infrequently happens that, though both the macular and the papular syphilodermata vanish without relics remaining, a very peculiar pigmentation remains. Spots, about the size of a lentil or larger, may sometimes be seen to develop where the pigment is diminished in amount or entirely absent, which spots are nearly always collected on areas which had previously been rich in pigment. The appropriate synonym for the condition appears parenthetically above. After the retrogression of the first macular or papular syphilide there frequently appear, especially in women, in certain parts of the skin light-coloured unpigmented spots, about the size of a lentil, which by peripheral increase attain the size of a penny or larger and overlap each other. The margins of the leucodermic spots are usually deeply pigmented, which still more prominently draws attention to the absence of pigment. Occasionally the spots of leucoderma are so close to one another that only narrow and frequently concavely notched lines intervene between them. The leucoderma disappears only very slowly, the affected parts being gradually supplied with pigment, which then undergoes the usual tinctorial alterations. Six to twelve months are usually necessary for the leucoderma to pass through all these stages; in certain cases even two to four years are required. Specific medication seems to have no effect on the duration of the lesion. The affected parts are neither markedly hyperaemic nor does exudation or desquamation occur. The difference in colour of the pigmentation is the only prominent feature in the affected parts of the skin, though some of the spots have been known to present the appearance of a scar. The affection is prone to attack especially dark-complexioned individuals; in the case of the negro it has been observed that white spots remain. Occupation and habits are not without influence upon the pigmentary deposition, and blonde individuals show sometimes the affection in the highest degree of development. Outdoor workers exposed to the action of the sun's rays, furnacemen and others may present deeper pigmentation on the exposed parts of the skin; in females the throat may be deeply affected, as well as the loins owing to the greater pressure of the clothing, and the face, the limbs, and trunk and the genital region may also be deeply pigmented in these persons, who seem to be more liable to suffer from the lesion than males. The pigmented syphilide is not an independent eruption, but a further evolutionary stage of a papular or macular syphilide. The process occupies a lengthy period, and is useful as to clue to the pre-existence of syphilis in the individual. It may, however, be mistaken for leucopathies due to other affections, from which it must be carefully distinguished. Thus, it is not infrequently confounded with common leucoderma or vitiligo, or fro the white scars left behind after the scratching induced by phthiriasis. In vitiligo, however, light spots are present which are generally lighter than those of leucoderma syphilitica, frequently cover a large surface, are found in any

locality, do not often present any symmetrical arrangement, and which give the hairs situated upon them also an appearance as if devoid of pigment. Furthermore, there are seen in vitiligo, but never in the pigmented syphilide, here and there within the portion devoid of pigment little islets which are more or less deeply pigmented, according as the case is one of old or recent pigmentary deposition. The diagnosis is usually easily effected when the syphilide and vitiligo coexist in the same individual. The presence of ordinary lice gives rise to white cicatrices after the healing of excoriations, especially about the neck and loins, and occurring as long radiating and distinctly cicatricial white streaks; in the pigmentary syphilide there is a symmetrical arrangement of the circumscribed round and crescentic smooth and unpigmented spots, which are of the size mentioned above.

TUBERCULAR SYPHILIDE.

The tubercular syphilide (Syn.: Syphiloderma Tuberculosum, Syphilis Cutanea Tuberculosa) is characterised by the development of infiltrations, about the size of a pinhead or almond; they are flat, hard, and coppery, and invade the entire thickness of the skin, thus differing from the papular syphilide, and simulating a developing boil but for the absence of inflammatory reaction. The efflorescences may be generalised, or may be seen in patches on certain parts of the body; it may be discrete or confluent; it may be circinate, serpiginous, or irregularly grouped. It may ulcerate, or the infiltrate may become absorbed. Permanent scars remain in every instance. It is exceptional to come across a discrete generalised efflorescence; it occurs in the late secondary or in the tertiary period of the disease, rarely before the end of the first years, though very occasionally it may be seen within six months of the appearance of the primary initial sclerosis. The rash usually appears grouped on one or more regions of the body, the indurated lesions having a tendency to coalesce and form circular, scaling, or, if ulceration takes place, eroding patches. The affloresecence may be seen developing perhaps as many as thirty or forty years after the chancre first made its presence known. Its course is very slow, it not infrequently is seen in relapses, and for locations prefers the face, - especially the lips and nose, - the ears, the back, and the lower extremities. It may be seen in the two varieties of non-ulcerating and ulcerating tubercular syphilide. The non-ulcerating form is characterised by the development of hard, dusky-red, chronic, scaling spots of a tubercular character; and when general and discrete are very easily confounded with any other lesion except the papular syphilide; this error is avoided by bearing in mind that the tubercle involves the entire thickness of the skin and appears at a later stage of the disease than does the papule. When grouped, the individual lesions of each group are usually much smaller than the lesions of the discrete general eruption; they tend to coalesce, forming circular or irregular patches, which increase in size peripherally, while absorption and more or less atrophy of the skin takes place in the centre. This results in a raised circular margin composed of

tubercles so merged that they can readily be distinguished as separate tumours, within which lies the depressed, pigmented, atrophic skin. These circles vary in diameter from a fraction of an inch to four or five inches. The surface of the non-ulcerating tubercle may be dry and glistening. More usually there is a covering of branny scales, constituting the tuberculo-squamous syphilide. These lesions develop with subjective symptoms, except when situated on the face; abuse of alcohol may give rise to considerable inflammatory troubles in this locality. The lesions not infrequently last for months despite treatment. They may form permanent cicatrices, incident to a process of interstitial absorption. The cicatrices become finally white after passing through brownish and coppery shades. The ulcerating tubercular syphilides are more serious than the dry tubercular efflorescence, both in their immediate effects and from the standpoint of prognosis. The dry lesion, after persisting for months may break down; more commonly the tubercle from the first shows a tendency to crust. This form of eruption is seldom generalised, usually affects certain regions of the body, shows a round grouping, and may involve a considerable area of the integument. The ulcerative process may be superficial, attended with a slight scabbing and followed with very little scarring; or it may be deep, invading the entire thickness of the skin, may be covered by thick scabs, and may be followed by dense cicatrices, which give rise to crippling and hideous deformities. The extension of the disease is slow; it heals with the formation of cicatricial tissue in one place while breaking down in another. This process may continue for months or years, the diseased area forming circles, broad bands, or irregular figures, and involving a large surface of the body. The whole of the face, for instance, may be disfigured by the lesion. This form is called serpiginous. Being an exposed surface, pathogenic germs may light thereon, with resulting phagedena, so that in a few hours a large amount of tissue may become destroyed. Serpiginous syphilides are usually to be found on the face and back. As in the case of other syphilodermata, in place of ulceration and destruction there may be hypertrophy, the cutaneous papillae growing fron the ulcerated surface of a tubercle to form a cauliflower excrescence secreting pus. It often happens that the scars of ulcerating tubercular syphilides are pathognomonic of the specific lesions; in the midst of the large scars will be found the small, depressed, round cicatrices of the individual tubercle. Tubercular syphiloderm is to be differentiated from lupus vulgaris, leprosy and cancer, especially the first, to which it at times bears a close resemblance. But in the tubercular syphilide adults with a history of syphilis or signs of other syphilitic lesions are usually affected; whereas lupus generally occurs, or at least first appears, before the twentieth year of life, without history or signs of syphilis. The tubercular syphilide commences as a coppery or brownish tubercle, which in one or two months becomes a characteristic

ulcer; lupus vulgaris begins as a tubercle, which does not ulcerate to the same extent for many months or even years. The tubercles of the syphilitic lesion are of a brownish-red or coppery colour, and are of comparatively large dimensions; the tubercles of lupus are often translucent, of lighter colour, and of small size. The tubercular syphilide the skin is distinctly infiltrated through its entire thickness; the infiltration of the skin in lupus is not so marked. The ulcers in tubercular syphilis, if distinct, are small and circular and punched out, if confluent they involve a large area, and the secretion may be copious and stinking; the ulcers of lupus are seldom distinct, they are superficial, not punched out, exhibit on regular form, and seldom secrete a considerable offensive pus, and involve large areas. The crusts of a tubercle syphilide are bulky and greenish or brownish-black; the crusts of lupus are thin and dark-red. The scabs of tubercular syphilide are irregular in shape and attachment; the scabs of lupus are arranged more regularly, attached in the centre, and loosened at the edges. The cicatrices of tubercular syphilide are soft, white, and circular, local treatment is useless, and internal specific medication is curative; the scars of lupus are distorted, irregular and puckered, active surgical intervention is effective, and internal syphilitic medication is unavailing. Generally speaking, it is important especially to bear in mind that in syphilis the lesions are firmer and deeper, and more rapidly, than in lupus; moreover, the disease is usually one of adult life and middle-age, whereas lupus appears, as a rule, first in childhood. In making a diagnosis between tubercular syphilide and leprosy it is important to bear in mind that the nodules of the former affection are more circular in outline, more reddish-brown or coppery in colour, more apt to be grouped in circular and crescentic forms, and more rapid in evolution. The ulcerations of syphilis are more rounded, less circumscribed in extent, the crusts are thicker, harder, and of a brownish, blackish, or greenish tint. Leprous ulcerations progress more slowly than those of syphilis, and they do not present a serpiginous mode of extension. The extensive superficial infiltrations of leprosy are not seen in syphilis. Leprous neoplasms are larger in volume, more protuberant, and crowded upon an infiltrated base, with oedema of the skin and glandual enlargement. Their seats of predilection are the face, the lobes of the ears, backs of the hands, and forearms, more rarely disseminated, while the nodules of syphilis are indiscriminate in their location and may come out where leprous tubercles seldom or never appear. The leontiasis of leprosy is much more pronounced than that of syphilis. The enormous nodular masses, the deep orbital and supraordital furrows, the pillowy-like protuberances of the cheeks, with loss of the eyebrows, are never observed in syphilis. A tubercular syphilide not infrequently presents a marked resemblance to a cutaneous cancer. The slow growth, the steady progress without attempt at cicatrisation, the scanty discharge, the lancinating pains,

the adenopathy, the absence of signs of syphilis, and the uselessness of mercurial medication, are diagnostic points of cardinal importance.

BULLOUS SYPHILIDE.

The bullous syphilide (Syn.: Syphiloderma Bullosum, Syphilis Cutanea Bullosa, Pemphigus Syphiliticus) makes its appearance, - not infrequently in newborn infants, - as rounded or oval, discrete blebs surrounded by a slight areola, varying in size from that of a split pea to that of a penny. The clear serum contained within the bleb shortly becomes turbid and blood-stained or even distinctly purulent. On rupture of the blebs, the contents form dark-yellowish or greenish-black scabs. These, growing from the bottom, by the drying of the freshly secreting pus of the slowly enlarging ulcer, finally result in raised, conical, imbricated crusts, often half an inch to an inch in height, and sometimed twice as much in diameter. These crusts are adherent, and usually overlap and conceal the underlying ulcer, though sometimes they may be set in the latter as a watch-crystal in its rim. Unless mechanically disturbed, they generally remain until the ulcer is healed. If they are removed, a deep, punched-out, unhealthy, granulating surface is exposed, covered with pus of a black and sanious appearance. It is a rare syphilitic manifestation, and is usually seen in broken-down individuals; it points to an inveterate toxaemia. The crusted ulcers follwoing bullar or pustules form the typical rupial lesion. The crusts of rupia are large, and are thicker and darker than those of any of the syphilides. The ulceration involves a large area and the whole thickness of the skin. It is a tertiary manifestation, and leaves cicatrices similar to those of deep ecthyma.

GUMMATOUS SYPHILIDE.

The gummatous syphilide (Syn.: Syphiloderma Gummatosum, Syphilitis Cutanea Gummatosa) is usually encountered three or four years after the primary lesion of syphilis; if appearing early, say in the first six months of the disease, the case is a serious one indeed. It differs from the other syphilides because it is a true neoplasm or granuloma, which, having once made its appearance, ultimately gives rise to easily-recognisable processes. The lesion prefers the face, and particularly the forehead, arms, forearms, the anterior surface of the tibia, particularly the upper third, the skin overlying the sternum and clavicle, the scrotum, the penis, and the female external sexual organs. The affection consists in the formation of rounded, painless, subcutaneous nodules, freely movable, and varying in size from that of a pea to a cherry. These slowly grow, reddening, infiltrating, and softening the superficial layers of the skin and breaking down to form deep, undermined, sloughing ulcers. Instead of being distinctly subcutaneous in location, it may assume the characteristics of a circumscribed ilfiltration of the skin. Its evolutionary and involutionary phenomena comprise four stages. First, formation, usually of long duration and unattended with

pain. Second, softening, fluctuation being felt when the tumour has attained its full size, from that of an almond to a hen's egg. Third, ulceration; the skin becomes discoloured and perforated, and a small quantity of puriform, gummy liquid is discharged. Fourth, reparation; after extrusion of the slough granulations form, growing from the periphery of the ulcer towards the centre. Rupture of a gumma gives vent to a mucilaginous liquid. The partially disorganised infiltrate adheres by its deeper portions to the subcutaneous cellular tissue, and is subsequently thrown off in the form of sloughs. By the process of ulceration a number of contiguous gummata may coalesce, forming one huge cavity with walls that show sloughing and irregular areas. Softening and ulceration may occur with great rapidity, though the stage of formation is slow and painless and only accidentally observed perhaps by the patient. In but a few hours, it may happen that great destruction and deformity are produced. There may be only one gumma, or there may be more, though seldom more than six; in rare instances a very large number may occur, either simultaneously or one after the other, usually showing a circular or circinate grouping and exhibiting a tendency to coalesce, forming a diffuse infiltration, which on ulceration may discharge by several openings through the blue undermined integument. Gummata are very commonly found on the forehead. One or more nodules may develop. They usually involve the underlying bone, producing caries, which may extend through its entire thickness, exposing the dura mater. In rare instances there occurs a deep and diffuse infiltration of the face, causing great thickening of the skin and presenting the appearance of leontiasis. Acute inflammation of this infiltrate is especially liable to occur in drunkards, and leads to extensive destruction of tissue and consequent deformity, and exceptionally to severe bleeding from erosion of blood-vessels. Tuberculosis or cancer may develop on these syphilitic lesions. In the case of the limbs the gummata are either single or several. As they appear on the legs they are usually multiple, and have for their seats of predilection the anterior and lateral surfaces of the upper third and themalleolar regions. When here located they break down readily and are subject to infectious inflammations. They are extremely obstinate to treatment, and ultimately assume the chronic indurated appearance of ulcers due to other causes, particularly when they are near the malleoli. Gummatous syphilides when they develop over the clavicle and sternum are often associated with underlying periositis and ostitis, so that it is difficult to heal the ulcerated lesions produced. The prepuce may show either diffuse gummatous infiltration or individual nodules. In either case the diagnosis from chancre can be made by the fact that infiltration preceded ulceration. Single ulcerating gummatous lesions of the glans penis may exactly simulate chancre. But the real nature of the lesion is indicated by its evolution and the history of the case, and the absence of the characteristic inguinal adenopathy of the chancre. The gummatous ulcer may become serpiginous or phagedenic.

The necrosis involves not only the imperfectly organised, round-cell infiltrate of gumma, but also the anatomically associated tissues, often exposing and eroding bone, destroying tendons and muscles, opening mucous channels, and resulting in disfiguring and disabling cicatrices. In the scrofulous, gummatous ulcers are particularly persistent. In rare cases these ulcers show papillary excrescences such as are found in cancer, which latter affection is not infrequently seen to develop from the scars of these ulcerations. The diagnosis of gumma is effected by the history of syphilis, or the concomitant symptoms of the disease, and the typical development of a painless infiltration at the seats of predilection. As this lesion is a late tertiary phenomenon, it may stand alone as an expression of the constitutional disease, as it not infrequently happens that its early development and the original syphilitic attack are unknown. A gumma during the early stage of infiltration may simulate benign tumour or sarcoma so closely that diagnosis can only be effected by the therapeutic test or by keeping the neoplasm under observation long enough to study its evolution. The published cases of sarcoma cured by mercury are probably incorrectly diagnosed instances of gummatous syphilide. Epithelioma may be simulated by a gumma that has ulcerated and shows papillary outgrowths. The mode of onset is, however, different, epithelioma beginning as a wart or an ulcer, and not as an infiltration. The histology is also sufficiently distinctive.

SKIN APPENDAGES.

HAIR.

Syphilis attacks the hair in various ways, either generally by constitutional malnutrition or locally by special disease. Quite early in the course of the luetic attack, not long after the appearance of the first constitutional symptoms, the hairs not infrequently become dry and lustreless, and are loosened in their roots, on account of which they fall out, - defluvium capillorum, - either in small but numerous areas over the whole scalp, occasionally in such a manner that the hair seems to be distributed in bundles over the head. In exceptional instances the thinning of the hair increases to total baldness, - alopecia, - which usually only occurs on the head, but now and then may involve the eyebrows, eyelashes, axillae, pubes; in short, all hairy parts. This form of alopecia, which is usually accompanied by some cutaneous syphilide, may frequently outlast the latter and continue as a symptom by itself; with this there is, as a rule, no strikingly diseased condition to be observed on the hairy scalp, especially no desquamation, no reddening, and no inflammation. In most cases the loss of hair will cease at last, after weeks or months new hair will appear, but it does not always reach its former luxuriant growth; it is only in rare instances, however, that the baldness becomes permanent. Trophoneurotic disturbances, syphilotoxic or otherwise, probably have something to do with it. In addition to this baldness, syphilitics show sometimes another form which is accompanied by desquamation and

so-called seborrhoea sicca, in which, however, it is not easy to discover any specific phenomena. Consideration has already been given to that variety of baldness which accompanies syphilitic eruptions on hairy parts, especially on the head, occurring in the form of maculae, papulae, and gummata; and it is therefore sufficient here to note that those syphilitic processes which lead to the destruction of the tissues infiltrated by them produce an irreparable loss of hair; this is comparatively rare after papular syphilides, but very common after gummatous and pustular syphilodermata.

NAILS.

It is unusual for the syphilitic diseases of the nails, consisting of dulness, discoloration, irregular deformities, splitting and splintering to occur by themselves; they generally accompany a palmar or plantar syphilis, which extends as far as the fingers or the toes, or which is especially located on the digits, and persists unchanged for some time after the palmar and plantar syphilide has vanished. Under such circumstances the affected nails only slowly return to normal, and absence of healing is now and then observed. The term syphilitic onychia has been applied to the lesion in which the bed of the nail is the seat of a syphilitic deposit, a papule or a gumma; this is accompanied by redness and swelling of a more or less extensive portion of the ungual phalanx, and the nail also will he more or less discoloured, corresponding to the greater or less amount of infiltration. The patient suffers great pain on account of the unyielding nature of the affected part. Syphilitic paronychia is the designation for a localisation of the syphilitic deposit on the matrix or the lateral nail furrow. This may, according to the nature of the process, be caused by a chancre, papule, pustule, or gumma occurring during the evolution of the responsible disease. The chancre as well as the consititutional papule and pustule are very apt to suppurate when situated on the nail furrow; ulceration of a gumma occurs still more frequently in this locality. In the latter case, the nail is thickened, infiltrated, and presents an ulcerated edge towards the furrow of the nail. Syphilitic paronychia is also accompanied, provided some part of the pathological process occurs on the bed of the nail, by violent pain, which persists until absorption of the deposit or healing of the ulcer occurs. Diseases of the nail occur mostly on single fingers or toes, though their development on more than one has not infrequently been noted. The affected nail seldom regains its normal appearance, and when the matrix and bed of the structure are involved shedding occurs.

MUCOUS MEMBRANES.

The appearances and changes in mucous-membrane syphilis are very like those observed in syphilodermata, the differences observed being due to the increased vascularity, diminished resistance to extension and ulceration on the part of the surrounding macerated mucous membrane, and a greater or less degree of irritation contingent to the secretions with which the

lesions are continually bathed. In the case of the throat, the vagina, the urethra, the inner surface of the prepuce, the mucous surfaces of the respiratory, digestive, and genitourinary tract, the erythematous syphilide may be observed. As in the case of the corresponding skin eruptions, the lesions first appear as discrete spots, which become confluent in a few hours and show a rather sharply circumscribed and circinate margin. The mucous membrane of the throat is most often attacked, the patient suffering from syphilitic angina, which may assume the acute or the chronic form. The hyperaemia and oedema involve the pharynx, tonsils palatine arches, and soft palate, but rarely extend to the hard palate, though discrete macules may be seen upon the latter. The macular mucous-membrane eruption becomes confluent so rapidly that, when first observed, the lesions depending upon their location closely simulate simple sore-throat, balanopothitis, vaginitis and urethritis. In view of the fact that these lesions may make their appearance before any of the other characteristic secondary symptoms, or as the only manifestations of the disease, and as their discharges are eminently contagious, it is very necessary that they be recognised as soon as they are observed. This can usually be done by the associated symptoms of syphilis, and the absence of anything else responsible for their appearance. The papular syphilide on the mucous membrane appears as a denudation or erosion, as a circumscribed diptheroid patch, as a vegetating papule, as a superficial ulceration, or as a scaly patch. These lesions are very obstinate to medication and are more apt to recur than the like lesions of the skin. They are exactly simulated by the papular syphilide, as it makes its appearance about the mucous orifices, on the scrotum, underneath the breasts, or in any region where heat, moisture and friction change its form. All kinds of papular eruption are classed under the general heading of mucous patches, though this term is not infrequently restricted to lesions covered by a grayish-white false membrane or to the later scaly eruption of the mucous surfaces. The papular erosion appears in the form of oval or rounded, small or large, infiltrated patches, exhibiting a raw-ham colour, denuded of epithelial covering, and showing a smooth, glistening surface. It is usually placed on the dorsum of the tongue, and associated with it are found fissures of the borders of the organ, and mucous patches. It is especially common in slaves to nicotine and alcohol, just as are all the other oral lesions of disease. The most frequent form of mucous patch is the diphtheroid papule, which makes its appearance as a small or large, discrete or confluent papule covered with a tightly adherent, grayish-white false membrane, which bleeds on being removed. The diphtheroid membrane is but little elevated above the level of the surrounding unaffected surface. It is somewhat sharply defined from the latter by a narrow hyperaemic zone often showing the dusky-red coloration of syphilitic lesions. There may be central absorption of the infiltrate and healing

in this portion of the lesion while there is extension at the periphery, thus giving rise to figures of a ring-like serpiginous form. This variety of the mucous patch is usually encountered on the mucous membrane of the cheeks and lips and at the angles of the mouth, where it becomes fissured, on the sides, under surface, and fraenum of the tongue, on the gums, on the soft palate, and tonsils. The affection may be attended with fissuring, with superficial ulceration, and, when situated on the tonsils, with deep and destructive ulceration. Under these circumstances they may become extremely sensitive, interfering with eating and drinking, or even speaking, and occasionally a very troublesome and irritating salivation. When the mucous patch is undergoing evolution, either under the influence of the constitutional or local treatment or spontaneously, and loses its diphtheroid covering, it presents the appearance of a papular erosion, then heals over, exhibiting a pigmentation of a temporary duration. When these diphtheriod papules become distinctlyinflammatory in type, they may react upon the anatomically related lymphatic glands, producing enlargement, and in some cases suppuration consequent on mixed infection. The vegetating papule shows the aptness for local enlargement which is sometimes characteristic of syphilodermata. The infiltration common to all syphilitic lesions is in the case of this affection particularly noticeable; in addition, the papillae of the mucous membrane are generally hypertrophied; there results a raised lesion, which is really an infiltrated papilloma, varying in size from a split-pea to an almond. The surface of this lesion may be covered with a grayish-white false membrane, or may be in a state of erosion. Peripheral extension and confluence may be conspicuous. Mucous membranes only seldom show the vegetating papule. It is very often encountered about the vulva in females and the anus in males. Rhagades of fissure are prone to occur from loss of elasticity of the parts on which these lesions appear. Vegetating papules are commonly associated with superficial ulceration; these represent infiltration in which there has been destruction of tissue, a distinct punched-out, freely secreting ulcer occupying the site of a lesion in its early stages presented the appearance of a vegetating papule. This ulceration is less often seen in the mucous membranes than upon the skin. The papulosquamous syphilide, or scaly patches or mucous psoriasis or opaline plaques, seldom constitute manifestations of constitutional syphilis. They are rounded or irregularly shaped, flat, smooth, bluish-white patches, such as would result from lightly brushing a surface with a strong solution of silver nitrate. The white colour is due to changes in the epithelium consequent upon chronic irritation and inflammatory infiltration. The normal columnar cells are replaced by squamous epithelium arranged in many layers, producing a species of cornification; as the thickening is greatest at the centre and becomes less marked towards the periphery, so the colour changes into that of the surrounding mucous membrane. The thickened epithelium is itself adherent to the underlying surface, but its removal does not give rise to haemorrhage. Very often the central

thickened epithelium exfoliates, while the lesion extends peripherally, leaving either a surface of hypertrophied and infiltrated papillae, a distinct erosion, or even healthy mucous membrane surrounded by a white ring of epithelium. Peculiar markings are now and then encountered on the tongue owing to the confluence of such patches. The affection is most often seen on the mucous membrane of the mouth, along the line of the upper and lower teeth when the mouth is shut, the patches being more or less confluent. The inferior surface of the tongue, its dorsum and lateral aspects, as well as the inner surface of the lips, may show the lesion. These white scaly patches give rise to little or no pain, unless ulcers exist in association with them. They differ from the other varieties of papular efflorescence in indicating a late stage of the disease. The lesion is difficult to cure, and may occur at any time in the late secondary and tertiary stages of syphilis. The third stage of the disease may be marked by the development of gummata, both in the mucous membrane and in the submucous connective tissue, diffuse infiltration or circumscribed neoplasms being the forms assumed by the lesion. Mucous gummata appear as small growths, which rarely attain the size of a pea before breaking down, forming punched-out, unhealthy ulcers, with a coppery infiltration around them. They are most commonly seen on the hard and soft palate, and often show a serpiginous grouping and slow extension in one direction contemporaneously with cicatrisation in the first-developed ulceration. Prior to breaking down the submucous gummata form large tumours, exhibiting, however, a marked tendency to soften towards the surface, giving rise to deep, punched-out ulcers with infiltrated margins. These ulcerating gummata give rise to stenosing cicatrices which may occur in nearly every portion of the digestive tract, though most often encountered in the rectum and gullet. From the appearance of the lesions alone, it is impossible to distinguish the erosive and diphtheroid forms of the mucous patch from the ulcers of simple aphthae. The latter affection, however, is usually more tender, more liable to be discrete, develops in a day or two, runs a rapid course, and disappears in a few days with or without treatment. The fact that it is especially in syphilitics that aphthous patches are apt to make their appearance, intensifies the diagnostic difficulty. There is recurrent herpes which produces small erosions of the oral mucous membrane of syphilitics, and these exactly simulate mucous patches. This eruption develops some years after a regular and assiduous course of mercury has apparently cured the disease. Medication has no effect on these erosions, for they vanish of their own accord in a few days and at irregular intervals return again. The diagnosis between the erosive and diphtheroid forms of mucous patch, aphthae, and herpetic lesions is effected by the history of the case, the presence of other signs of syphilis, and the effect of a specific medication. It becomes necessary sometimes to make a diagnosis between the scaly patches, - mucous psoriasis or opaline plaques, - and non-specific leucoplakia or hyperkeratosis.

The latter sometimes develops acutely, particularly in women and children. The rapidity with which they change their form and distribution should effect their recognition. It is by no means infrequent to be puzzled over the diagnosis between the chronic form of leucoplakia and the syphilitic affection. The idiopathic leucoplakia, occurring in smokers and drinkers without syphilitic taint, is even slower in development than specific lesions; the white colour and the heaping up of epithelial cells are more marked and irregular; there is not the same tendency towards central exfoliation, as the lesion extends peripherally; hence the resultant ring-like configuration is less common. In leucoplakia the lesions are more often found on the tongue and lower lip, subjective sensations are more marked, and cure cannot be effected by mercurial medication.

TONGUE.

It is only very seldom that a chancre occurs on the tongue; when present it is generally observed on the tip or hear it. When mucous patches are numerous and coalesce there is general swelling of the tongue, the latter showing on its border the imprint of the teeth. Mucous patches are very commonly found along the sides of the tongue, and may be characterised by great pain from fissuring. Roseola is seldom seen and is transient; it gives rise to slight desquamative pigmentation. The ulcers of secondary syphilis are generally small and superficial, and are accompanied by few subjective symptoms; inflammatory symptoms are inconsiderable, even in the presence of deep ulcerations. The tongue requires to be dried with a towel before smooth patches can be made out. They then appear as smooth, shining surfaces from which the epithelium has entirely disappeared. There is no sign of erosion. The lesions are rounded and arranged in circles or segments thereof. Patients in either the secondary or tertiary stage may show this form of desquamating glossitis, and sometimes leucoplakia is preceded by its formation. Syphilitic leucoplakia in scaly patches are usually never seen except on the tongues of slaves to tobacco or alcohol. They show the grayish-white, circular, circinate, or annular stains already described, and give rise to no symptoms unless extensive, when they may be associated with some stiffness of the tongue interfering with articulation; there may also be tingling and a feeling of numbness. These affections are important on account of the cancerous tendency which they sometimes exhibit. Tertiary syphilis may affect the tongue either in the form of diffuse gummatous infiltration, - sclerous glossitis, - or as circumscribed gummata. These gummatous lesions develop on the tongue more frequently than in any other portion of the mouth. They are much more commonly seen in men than in women, probably on account of smoking and drinking in the former individuals. The diffuse gummatous infiltration or sclerous glossitis is a variety of chronic myositis. It may affect any part of the tongue or the whole of it, and may be either superficial or deep. It commences as a slowly progressive,

hard swelling, usually affecting only one side of the tongue, and producing marked asymmetry. When both sides are enlarged there may be so much swelling that the patient will not be able to close his mouth. This condition develops with comparatively slight symptoms. There is no pain, the patient complaining of only a feeling of weight and stiffness, making articulation somewhat laboured. After weeks or months the swelling gradually subsides coincidently with the occurrence of atrophic changes, which give rise to even greater stiffening and induration than were seen in the early stages of the trouble. The tongue then shows irregular lobulations, with marked alteration of the mucous membrane. There are often smooth, red patches, due to exfoliation of epithelium, or areas of greatly thickened epithelium, which may present the typical white appearance of syphilitic leucoplakia. Ulcers may occur from mechanical irritation by the teeth; cracks and erosions are also seen. The circumscribed area or gummatous glossitis may be superficial or deep, that is, it may involve the mucous or submucous tissues or may commence in the substance of the muscles. The superficial gummata appear as small, hard nodules of the mucous membrane or submucous tissue. They vary in size from a pea to a cherry. They give rise to little or no pain, and if not treated by mercury internally, usually soften and ulcerate, forming punched-out, indurated, undermined, unhealthy ulcers. When these gummata are multiple and confluent, and especially when they are phagedenic in type, they may destroy the greater part of the tongue, and may kill the patient from backward extension of the inflammation and sudden oedema glottidis. The deep or muscular gummata commence as hard, painless, neoplasms, firmly adherent to the surrounding tissues. They are nearly always situated on the borsum of the tongue. They occasion little or no pain, causing inconvenience only from the limitation of motion. They grow slowly, usually not softening and ulcerating for two or three months. They vary in size from a cherry to a lemon. Deep, punched-out, and indolent ulcers are formed when they finally undergo ulceration. The ulcerating gummata of the organ, even though deep and confluent, excite little pain except on motion, and all the symptoms of inflammation are absent. A disabling and deforming cicatrix remains after the healing of the ulceration. The recognition of the syphilitic affections of the tongue is effected in the general way described above. The organ is especially prone to be attacked by recurrent herpetic lesions; ichthyosis and superficial glossitis are other affections which are apt to simulate syphilis of the tongue; the same is true also of an infantile affection characterised by an erratic exanthem, circinated herpes, and the formation on the tongue of small and red patches or concentric rings. The senses of taste and touch are unaffected; sometimes, however, there may be some intensification of these. Not infrequently this affection is mistaken for mucous patches or hereditary disease. Gummata of the organ may be confounded with tubercle and cancer of the organ. Lesions of tubercular origin are generally single, and are seated

at or near the tip or on the dorsum of the tongue. They commence at cracks or fissures, attended by swelling, and slowly form shallow, jagged, painful ulcerations, with non-indurated borders, which are often surrounded by minute, yellowish points with opaque centres. These are tubercular granulations undergoing caseous degeneration. They are frequently ulcerated off and are never seen in syphilis. Tubercular glossitis seldom makes its appearance as an isolated expression of syphilis, the larynx and lungs or other organs usually exhibiting implication in the taint. The tubercle bacillus may be found on microscopic examination, or may be inoculated on laboratory animals and present certain well-recognised characteristics. Gummata commence as single submucous or muscular involvement, opening after a time by a narrow sinus, ulcerating and discharging like a boil, and showing a sloughing indurated base. The outcome of chronic irritation may be the development of a cancer at the border of the organ. It commences as an erosion or ulcer, which subsequently becomes indurated, may show about its borders epithelial pegs, is shortly followed by glandular involvement, is steadily progressive and somewhat rapid in its course, and is frequently very painful. The diagnosis may be rendered difficult or impossible by the development of a gumma beside it. Bearing in mind that the following points, the diagnosis between the two affections can be readily effected: Cancer occurs chiefly after the fiftieth year; a gumma usually earlier in life. In cancer there is often a malignant history, and the affection is preceded by lingual psoriasis; in gumma there is no cancerous history, and the affection is not preceded by lingual psoriasis. A cancer is situated not infrequently on the lateral and under surfaces of the tongue and is unilateral; a gumma is invariably located on the dorsum of the organ and may be bilateral. A cancer is single; a gumma may be multiple. A cancer commences as an irregular, indurated, superficial ulceration, which rapidly extends and is followed by marked induration; a gumma commences as a thick, rounded, indurated opening like a furuncle, and leaving a deep hollow ulcer and preceded by marked induration. A cancer has elevated, irregular, everted borders, its ulcerating surfaces bleed rapidly on mechanical interference, and there is no cavity resembling abscess; a gumma has punched-put, sharply defined edges, a sloughing surface, not easily excited to bleeding, and excavation like an abscess cavity. The discharge of a cancer is profuse, offensive and irritating; the discharge of a gumma is moderate and not very offensive. In a cancer there is lancinating pain oftentimes darting towards the ear, great functional disturbances as of swallowing and mastication and speech, and general cachexia; a gumma is nearly painless, there is only slight functional disturbance, and cachexia is not observed. In cancer the submaxillary lymphatic glands are progressively enlarged and densely indurated; in gumma there is no lymphatic involvement, or only slight swelling and tenderness. Microscopical examination of a cancer shows pearly bodies; in a gumma embryonic cells in various stages of granular degeneration. In cancer of the tongue specific treatment is useless or

even injurious; whereas this cures a gumma and other concomitant manifestations of the constitutional disease.

PALATE.

The various early syphilides of the secondary stage may be observed on the soft palate, the uvula, and the pillars of the fauces; where also mucous patches are not infrequently seen. Tertiary syphilitics may show gummata of the hard palate; the lesion commences in the periosteum, and the tumours are found in the middle line forming elevated, sometimes painful, usually multiple, elastic swellings, which shortly soften and ulcerate, exposing the bone, resulting in necrosis of the latter and in direct communication between the nasal and oral cavities. Treated in time, gummata commencing on the oral surface of the palate need not result in perforation of that structure. But when, as is common, they commence on the nasal side of the palate, their presence is unsuspected until a dusky, circumscribed swelling appears on the roof of the mouth, which in a very few days shows an opening into the cavity of the nose. This opening is the funnel-shaped ulcer ending by a larger opening on the nasal side of the palate. The lesions may be multiple, and by confluence can produce large openings in both the hard and the soft palate. They sometimes develop very rapidly, destroying the uvula and the greater part of the soft palate in a few days. When these ulcerating gummata heal there may result great cicatricial deformity and perforations for the cure of which the surgeon's skill is severely taxed. Gummata of the soft palate undergo their evolution slowly, without pain or discomfort being occasioned. There may be a great nodular infiltration, or but a single gumma at one point. Usually there is a diffuse infiltrate, which can be readily felt on palpation. If this primarily involves the pharyngeal wall of the palate, the only appreciable symptoms will be stiffness and immobility, which are diagnostic signs of considerable value. These signs can be elicited by exposing the pharynx while the throat is being examined and instructing the patient to utter some sounds requiring the assistance of the soft palate for their production. When immobility is thus detected and is found to be associated with nodular induration, the diagnosis of gumma is apparent forthwith. If the anterior wall is affected, the dark-red, oedematous, sometimes nodular mucous membrane gives a clue to the nature of the disease. This diffuse infiltration is apt to ulcerate, destroying a part or the whole of the palate and uvula. The inflammatory process is not limited to the soft palate, often extending to the anterior and posterior arches. The cicatricial processes following ulceration may produce great deformity. The soft palate may be partly or totally wanting, or may be adherent to the posterior pharyngeal wall, partly or completely separating the nasopharynx from the pharynx; though not adherent, it may be stretched tightly across the nasopharynx, and suppleness and mobility are in it no longer observed. Circumscribed gummata of the soft palate may be single or multiple; they are commonly placed on the oral

surface. They usually ulcerate if untreated, often causing perforation. Gummatous ulceration involving the velum, the tonsil, the arches, and the lateral wall of the pharynx, and opening up the Eustachian tube, often commences in the recess formed by the juncture of the anterior and posterior arches and the upper surface of the tonsil. This ulceration may be extensive and rapid, spreading wide of the tonsil and palato-pharyngeal fold, and the carotid artery may be eroded and bleed dangerously and fatally.

PHARYNX.

Syphilis is one of the affections that may find an expression in the pharynx, the common lesion being submucous or subperiosteal gumma. These gummata generally occur as one or more hard, painless swellings of the posterior wall. Softening and ulceration follow, resulting in deep, punched-out, indurated ulcers. When gummatous ulceration involves both the soft palate and the pharynx, adhesions may take place in the process of healing, which entirely shuts off the nasal cavity from the mouth; or by involvement of the arches and tonsils there may occur a great narrowing of the pharyngeal communications between the mouth and the larynx. The late ulcerating affections of the soft palate and pharynx are very commonly accompanied during their course by pain, disability, and interference with hearing, and may be followed by intractable catarrh of the nasopharynx incident to the deformity consequent on scar-formation. An outcome of this cicatricial contraction may be marked alteration of the voice; deglutition may be difficult; or the isthmus of the fauces may be so narrowed that there will be marked obstruction to the entrance of air. Such cicatrices are almost pathognomonic of ulceration from this specific cause. Gummata of the pharynx are usually associated with tertiary infiltrations of the nasal or the oral mucous membrane. The throat often presents an irregularly ulcerated appearance, and exceptionally extremely chronic, distinct, punched-out, typical gummatous ulcers develop, which may attack the underlying osseous structures if neglected. It is only very seldom that gummata make their appearance upon the lips or cheeks, and less often also on the tonsils. The syphilitic ulcerative process occurring on the tonsils and not infrequently regarded as gummatous, is in reality a vegetating papule, which ulcerates, spreads rather quickly, and may assume a diphtheroid or even a phagedenic character. It is much more superficially located than a gummatous lesion. The occurrence of gummmatous tonsillitis is characterised by painless, hard enlargement, with little functionless disturbance, except perhaps some interference with hearing. The mucous membrane, at first stretched tightly over the swelling, becomes somewhat less tense as softening takes place, and finally ruptures. Then result one or more punched-out ulcers with indurated borders and gray sloughing surfaces. These may become confluent, involving the anterior arches, and may produce marked deformity when healing occurs. Impairment of hearing and permanent closure of the Eustachian tube may be

produced by cicatricial contractions due to these gummatous lesions. The posterior wall of the pharynx, the alveolar border of the upper jaw at the insertion of the incisor teeth, and the hard palate most often exhibit subperiosteal gummata ending in caries and necrosis of the part.

ALIMENTARY TRACT.

The rarity of syphilitic affections of the continuation of the alimentary tract from the mouth is commensurate with the frequency of same at its commencement in the oral cavity, with perhaps the exception of the rectum, as will presently be seen. Very little is known regarding irritative lesions, on account of the absence of unpleasant symptoms in early syphilis in the oesophagus and stomach, these parts are seldom explored by the special instruments devised for the purpose - the oesophagoscope and the gastroscope. Gummatous ulceration may occur in any portion of the alimentary canal. It seems probable also that the mucous membrane of this tract is subject to specific general or local inflammation during the secondary stage of the disease. Thus the symptoms of catarrhal gastritis or gastroenteritis which are so frequently observed in association with syphilitic fever or are seen before or during the outbreak of the first erythema may be due to the direct effect of syphilis upon the stomach and intestines. On account of the favourable influence of mercury, it is possible that the chronic gastritis often associated with specific lesions of the liver or spleen may also represent a specific infiltration.

OESOPHAGUS.

The oesophagus is not affected by the superficial lesions of early syphilis. Neurotic dysphagia from paralysis of the tube may be observed in the course of the disease, and seen to vanish under mercury. Cases have also been recorded, in which there have occurred cicatricial narrowing and gummatous infiltrations and ulcerations. Cicatricial contractions due to deep ulcerations are peculiarly obstinate to treatment, or the symptoms of the condition may not be seen until long after the luetic phenomena elsewhere have disappeared. In several cases a syphilitic stenosis has required the performance of the operation of gastrostomy. Consequently, when an obstruction of the lumen of the oesophagus occurs in an individual who is known to have suffered from syphilis, or is still suffering from it, we should bear in mind its probable connection with the disease, the more so as any other cause for the consequent dysphagia may not be found. The diagnosis is not unfrequently difficult, and the condition favours the development of a malignant growth. Cases recognised early usually do well under specific treatment; but when the lesion is overlooked and the contraction of the tube occurs a cure is almost impossible.

STOMACH.

Syphilitic subjects sometimes present symptoms of acute and chronic gastric catarrh, as well as of gastric ulcer. This latter, even when occurring in a syphilitic, may be due to some non-syphilitic cause, or

it may be the outcome of the breaking down of a gumma. In the latter case it is usually located near the lesser curvature in the region of the pylorus. The symptoms of gastric ulcer of syphilitic origin do not differ from those as from other causes arising. The diagnosis must be based on the therapeutic test, as well as the fact that nocturnal exacerbations are now and then observed.

INTESTINES.

The occurrence of syphilitic lesions of the intestines was known to the earlier syphilographers. Compared with the specific affections of the stomach, those of the intestines are perhaps more frequent, if we include in this category syphilitic enteritis occurring in the congenital disease. Syphilis of the intestine has been demonstrated by post-mortem, accompanying the same affection of the stomach. Only very seldon are peritonitis and perforation of the bowel observed. There is nothing about chronic syphilitic enteritis to distinguish it from a non-syphilitic catarrh, except perhaps the beneficial effects of specific treatment. In the early stage of syphilis there not infrequently occurs a stubborn diarrhoea which resists the usual remedies and is cured by the internal use of mercury. It must be remembered, however, that enteritis may also develop during a mercurial course as a symptom of the toxic effect of the metal. The possibility of the diarrhoea being due to the action of mercury must be determined. Ulceration of the small bowel may be the outcome of the breaking down of either a gumma or the intestinal sympathic glands; ulceration is most commonly observed in the upper portion of the small intestine. The ulcers are multiple and grouped, exhibit the characteristic infiltration of gummatous ulcers, and are late tertiary manifestations. A stricture of the gut may ultimately occur. The presence of other symptoms of syphilis must be utilised in the diagnosis.

R e c t u m a n d A n u s.

The endering of the intestine is comparatively frequently syphilitic. Chancres have often been seen at the anus and higher up the gut, as well as in men who have inclinations to disgusting practices and in women who submit to same. Induration may here be observed in the chancre. The latter may ulcerate early and result in painful fissured ulcers, in consequence of the uncleanliness and dilatation which is unavoidable during the act of defaecation; such fissures are sources of torture during the after act. Under the exhibition of mercury healing occurs, though contraction of the lesion not infrequently results in stricture of the part. Mucous patches are not very common in the rectum, though they seem to be more common nowadays than formerly. In those cases in which they occupy the perineum and the neighbourhood of the anal aperture, it is common to find eruptions of some sort stretching out towards the mucous membrane, or there may be fissures and ulcers of the anal folds, which are studded with papules and encroach on the mucous membrane. Syphilitic papules have also been observed farther up on the mucous membrane of the rectum; in certain cases they attain so large a size that they symptomatically simulate

stricture of the rectum; they respond very well to mercurial exhibition. Mucous patches are generally situated on the posterior wall, but occasionally also on the right or left side, rarely occupying the entire circumference of the rectum. Despite the fact that these lesions are nearly always ulcerated, most of the patients do not complain of pain on defaecation; sometimes they bleed during the act, and in certain cases tenesmus is present with a profuse discharge of mucus and pus. Rectal patches can usually be explored with the finger. Though sometimes extending to the rectum, anal papules usually are restricted to the neighbourhood of the aperture where observed. Not a few syphilitics present gummatous lesions of the rectum , which commonly lead to ulceration and destruction of the entire mucous membrane , thus laying bare the muscular coat of the bowel, which may also be riddled with ulcerations and vastly increased in size. The glands of the large bowel may show bleedings and ulcerations. In certain cases the syphilitic process increases in intensity towards the rectum and leads in the region of the internal sphincter to a complete loss of the mucous membrane and denudation of the muscular layer, there being present also watery and bloody evacuations, a certain amount of tenesmus and loss of abdominal sensation with involuntary passage of faeces. The puffiness and irregularities of the mucous membrane noted on examination should give a clue to the nature of the existing lesion. The like alterations have been noted in rectal stricture, which is almost unavoidable on healing of the ulcerative process. The stricture gives rise to proctorrhoea and pain in the rectum, with involuntary defaecation alternating with constipation. Should gummata of the perirectal tissue break down, perforation of the rectum, of the vagina, or externally in the neighbourhood of the anus may occur, and a number of fistulae may be produced in this way, - rectoperineal and rectovaginal fistulae, - which are accompanied by an ichorous discharge from the rectum. In addition to this, strictures of the rectum are commonly seen. Ulcerating lesions extending high up may occasion peritoneal inflammation. The rectum may be the seat of that form of infiltration which ends in contractions, forming a syphilitic callosity and called sometimes the anorectal syphiloma. Here an infiltration occupies the anorectal walls, which, changing into contracting fibrous tissue, tramsforms the rectum into a rigid narrow cylinder about an inch long; the thickness of the walls may reach a little less than that and mainly affects the ampulla, the neighbourhood of the sphincter generally escaping. Implication of the anus is observed only when the process extends from the rectum, in which case the anal portion will show a lobulated appearance. The affection in its early period runs its course without producing symptoms, and only on occurrence of the stricture is attention directed to its presence. Syphilitic lesions must be distinguished from cancerous or tuberculous affections. In the former, which almost exactly simulates infiltrating and ulcerating gummata, one should bear in mind that it is apt to early contract tight adhesions to neighbouring parts, and is usually

placed higher up the bowel than gumma. Excision of a part of it would allow of histological diagnosis. In the case of tubercular ulceration other symptoms of the consumptive taint are present.

LIVER.

Syphilitic lesions of the liver may be observed in both the secondary and tertiary stages of syphilis; the former occurrence is rare, but tertiary affections of this organ are extremely common. The early hepatic affections are seen in the first three months of syphilis as hypertrophy, which may or may not be accompanied by pain, tenderness, and jaundice. The enlargement is considerable, and may increase the dimensions of the organ to twice the normal. No nodules can be felt, only a general hypertrophy. These cases do well, and in about three months more the liver subsides to its normal dimensions, provided mercurialisation is faithfully persevered with. Icterus developing during the secondary stage is seldom due to syphilis. Most of the cases, when unattended by enlargement of the liver, are produced by intercurrent affections, such as biliary catarrh. In the tertiary stage of syphilis we have to do with either a diffuse interstitial hepatitis or a gummatous inflammation of the liver. These tertiary lesions are in marked contrast to the secondary implication of the organ, and for the reason that they rarely make their appearance until late in the course of the disease, from the fourth to perhaps the fortieth year. They are common, persistent and intractable, and occasion permanent structural alterations. Tertiary hepatic lesions are undoubtedly predisposed to by alcoholism, injury, and neglect of treatment. In interstitial hepatitis of diffuse gummatous infiltration there is a new cellular growth which runs a course similar to that of an ordinary cirrhosis. It commences as a hyperaemia, accompanied by an abundant small round-celled infiltration of the perivascular connective tissue of the organ. This cellular hyperplasia usually makes its appearance in the form of a perihepatitis, involving the capsule in disseminated patches, and resulting in more or less dense adhesions to surrounding organs. The infiltration of the substance of the liver may be general, though it is commonly found in patches. The cellular infiltrate becomes, in part at least, converted into connective tissue, which by its contraction gives rise to narrowing and obliteration of ducts and vessels and atrophy of the hepatic cells. There is at first an increase in the size of the liver, general or localised, depending upon whether hyperaemia and cellular infiltrates are diffuse or appear in discrete patches. Ultimately, as the round-celled infiltrate in part undergoes fatty degeneration and is absorbed, in part becomes converted into connective tissue and contracts, the enlarged liver becomes smaller; but this lessening in size does not stop when the organ has reached its normal dimensions; the atrophic process steadily advances; the surface of the organ is lobulated, is marked by deep furrows, is creased by dense fibrous bands, and the liver is

distorted almost beyond recognition. The contraction of the fibrous bands is often so pronounced that some of the lobulations thus produced are almost completely cut off from the rest of the organ, appearing to be attached only by fibrous tissue surrounding the base. Accompanying the atrophy in one portion of the organ we may observe overgrowth in another. This may be due to amyloid degeneration or to compensatory hypertrophy, the intact portion of the hepatic substance developing so as to replace the destroyed portion. The convex surface of the liver more often shows the furrowing and lobulation than the concave. In gummatous hepatitis tumours are formed similar to those in other parts of the body. The neoplasms in question vary from the size of a pea to a hen's egg; they are mostly found in the region of the suspensory ligament and along the course of the portal vein, though they may appear in any part of the liver; they may be grouped or irregularly disseminated. They are gray or yellowish in colour and, according to their progression, are either solid throughout or broken down in the centre. When the centre of the mass softens and undergoes fatty and caseous degeneration and becomes absorbed, its peripheral portion is converted into fibrous tissue, which contracting produces on the surface of the organ deep irregular puckerings, sometimes so marked as seemingly to divide the right lobe of the liver into two halves. In the deeper portion of the liver irregular branching nodules are formed, in the centre of which a small quantity of caseous material is sometimes observed. Perihepatitis usually accompanies the process, resulting in dense adhesions between the liver and surrounding structures; this is especially noticeable on the upper surface organ, and there constitutes a valuable aid to diagnosis. In association with the lesion may be observed interstitial hepatitis, amyloid degeneration of the liver, spleen, kidneys, and intestinal mucous membrane. Ulceration does not occur; the gummata undergo a very slow evolution and it may be years before final cicatrisation occurs.

Interstitial hepatitis seldom gives rise to prominent symptoms. In the early stage there is a feeling of weight in the region of the liver, followed, often after a long period, by hypertrophy, slow in development, and unattended by signs of inflammation. Sometimes the hypertrophy is general, the lower border of the liver extending about three inches or less below the margin of the ribs, and presenting to the examining finger a smooth and regular surface. Commonly the hypertrophy, which is due to the perivascular hyperplasia pressing on the portal vein, it not so marked, palpation revealing surface irregularities or elevations. It is not always that even such functional disturbances as gastric phenomena are observed. As the affection progresses and atrophy sets in, the only sign which may be considered characteristic is the deformity incident to the cicatricial contraction. The only signs suggestive of a specific origin are a nodular surface, and irregular fissured border, gradually becoming less perceptible to palpation in one portion while overgrowth is observed in another part, and adhesions. Not many cases develop jaundice; the haem-

atemesis, diarrhoea, dyspepsia, and dropsy of the feet or other affections may in this lesion also be observed. Ascites is common, the fluid accumulating slowly at first, but returning rapidly on aspiration. Commonly there are no warning symptoms; a painless ascites gradually develops, associated with icterus, discoloured urine, oedema of the ankles, varicose veins, and albuminuria in some cases. At its commencement gummatous hepatitis may occasion no suggestive symptoms and not seriously interfere with the hepatic functions. As the affection progresses, the accompanying hepatitis, perihepatitis, and amyloid degeneration cause most of the symptoms observed. The liver is generally of normal dimensions, presenting to palpation a nodular and irregular border. Gastrointestinal disturbances are prominent, pain may be severe and continuous, a serious complication when the atrophic process is well developed in haemorrhage from the oesophagus or the stomach. Frequently observed in association with the disease is enlargement of the spleen; albuminuria is also common. Emaciation and considerable cachexia are the usual outcomes of this involvement of the liver, spleen, and kidneys. Tertiary syphilitic affections of the liver, if treated early, do not invariably do badly. The gummatous form yields more readily to treatment than the diffuse or cirrhotic form. An open mind should be kept regarding the cases in which extensive fibroid changes have occurred, and particularly when there are associated lesions of the kidneys and spleen and profound cachexia. The recognition of hepatic syphilis is based upon alterations in size and shape of the liver, associated with much milder symptoms than are attendant on alterations arising from other causes. There is usually a history of syphilis; stomach troubles are not very pronounced, or, if marked, do not develop until late in the disease; serious effusion into the peritoneal cavity is moderate in amount, but is rapidly reprodduced after operative removal; ordinary hepatic cirrhosis does not possess these characteristics. Cancer of the liver may be simulated by gummatous hepatitis. The former affection, however, rarely occurs except in those past middle-age; it affects both lobes of the liver. It is not so liable to contract adhesions as the gummata; hence its nodulations are more readily felt; it is accompanied by pain and icterus, and produces early the profound cachexia; it is of much for rapid evolution than the affection with which it not infrequently confused. Amyloid degeneration is so often associated with syphilis that the latter is regarded as responsible for its production. It may follow extensive suppurative processes. It is also found, however, in conjunction with the sclerotic and gummatous forms of hepatitis, and is commonly complicated by a similar affection of the spleen, the kidneys, and often the intestinal mucous membrane. The liver rarely reaches the tremendous size observed sometimes in amyloid degeneration from other excitants. It does not in itself give rise to ascities, and there are no functional disturbances until it is far advanced. Ultimately digestive troubles become marked, and, as

the result of similar degeneration of the intestinal mucous membrane, multiple ulcers form and occasion bloody stools. The patient is cachectic; coincident renal involvement gives rise to albuminuria, and there is generally a certain amount of oedema present. It is a late manifestation of syphilis. The diagnosis is based on the finding of an enlarged, smooth, firm, non-sensitive liver, together with the other syphilitic phenomena. Most of the subjects of the affection die sooner or later, and the prognosis is therefore about as bad as it could possibly be.

SPLEEN.

The spleen very commonly participates in the syphilitic attack, owing to its close association with the lymphatic system. The enlargement of the organ due to amyloid degeneration has been noted above; and in addition to this one often finds hypertrophy due to hyperplasia. There are two forms of splenic syphilis, the flaccid or soft and the indurated, the latter not infrequently resembling the waxy variety. Less common are splenic gummata. Affection of the spleen is sometimes noticed very early in the course of syphilis. This early enlargement may not be seen, however, until later in the secondary stage. It is not accompanied by any functional disturbances. There is nothing to call the patient's attention to the swelling, and it is seldom found until a careful search is made for it. In the tertiary stage of syphilis gummata or disseminated or localised splenitis, resulting ultimately in partial cirrhosis, may be observed. There are no important symptoms, and the trouble is usually only detected when the patient comes to autopsy. The presence of such lesions, however, may be suspected sometimes from the clinical detection of increase in size and consistence of the organ, and when there is tenderness elicted on deep pressure. The involvement of the spleen in advanced syphilis is commonly associated with syphilis of the liver, the symptoms of which usually mask the splenic disease, though marked leucocytosis and the presence of pigmented masses in the blood may raise the suspicion of its existence.

PANCREAS.

Syphilitic affections of the pancreas are admittedly rare and difficult to discover during the lifetime of the patient. Their presence may sometimes be suspected from the occurrence of fatty diarrhoea, glycosuria, and epigastric pain in the subject of the disease. Other abdominal organs are simultaneously involved. The lesions take the form of gummata or interstitial inflammation.

PERITONEUM.

Peritoneal involvement in the course of syphilis is exceedingly rare. Its sympathetic affection when other organs are implicated, as the liver and intestines and spleen, is not so infrequent. The occurrence of a diffuse purulent peritonitis with coincident intestinal ulceration has been reported.

KIDNEYS.

The kidneys are less frequently syphilitic than are the genitals, the nervous system, or the liver.

They may be involved at any time during the course of the constitutional disease, the lesions produced, with the exception of gummata, being the same as seen in the various forms of Bright's disease. They are predisposed to by tuberculosis, rheumatism, gout, and alcohol; but the real exciting cause is either the specific virus of syphilis or the irritating toxin of the casual agent which this organ in all probability excretes. The kidney may be attacked soon after the development of the chancre, when there will be intermittent, transitory, and moderate albuminuria. The total quantity of urine passed daily is not diminished in this precocious renal involvement, nor is the specific gravity notably affected. A few hyaline casts may be discovered on microscopic examination. Treatment quickly vanishes this early albuminuria of the early eruptive stage of the disease. The acute parenchymatous nephritis of syphilitics is characterised by the occurrence of lesions of the glandular part of the kidney, producing a condition analogous to that known as the large white kidney. It is in reality a parenchymatous nephritis, and differs in no way from this acute or subacute form of Bright's disease; it has the same complications and not infrequently terminates the life of the patient. There are observed albuminuria, granular epithelial and blood casts, lessened secretion of urine, headache, oedema, and other classical symptoms of acute renal inflammation. The diagnosis is based on the examination of the urine and on the history of syphilis or other signs of the constitutional disease. A favourable prognosis may be given; but an unfavourable one if parenchymatous nephritis occurs in late syphilis and is associated with gummatous infiltration or amyloid degeneration of other abdominal organs. The exhibition of mercury is generally curative, although the albuminuria sometimes persists and the nephritis becomes chronic. Interstitial and gummatous nephritis are usually seen during the tertiary, sometimes in the late secondary, stage of syphilis, and are of much more serious import. Interstitial nephritis differs in lesions in no respect from the non-specific form. The symptoms are those of chronic nephritis. This affection is more grave than the early nephropathy. In fact, after fibrous tissue has once firmly developed cure is impossible. The lesion consists of at first a cellular infiltration of the interstitial stroma and of the walls of the vessels and perivascular spaces. This infiltration is followed by sclerosis, causing atrophy and distortion of the organ, with cortical location most pronounced. The symptoms of this variety of renal inflammation are the usual. There are polyuria, lowered specific gravity, light-straw colour of the urine, moderate amount of albuminuria, hyaline and granular casts, increased arterial tension, oedema, headache, asthma, and the other well-known classical signs. The coincidence of other manifestations of the constitutional taint alone justifies a diagnosis of special origination. The outlook is gloomy in the extreme.

Gummatous nephritis is a rare disease. The individual neoplasms seldom are of large size. They are generally multiple and are found chiefly in the cortical substance or in the pyramids. Associated with them is almost

always interstitial nephritis. Amyloid degeneration is said to by be far the most common manifestation of renal syphilis; than granular atrophy, and next gummatous involvement. A fourth form, called syphilitic glomerulonephritis, has been described. It is characterised mainly by the occurrence of haematuria, and uraemia is the usual termination. Syphilis has been blamed for not a few cases of diabetes insipidus, the more so as the exhibition of mercury has proved curative.

URETERS.

Syphilitic involvement of the ureters, when occurring, produces no symptoms appreciable during life; and at autopsy the lesions observed will be those peculiar to the stage of the disease at which the patient died.

BLADDER.

Vesical syphilis is also rare, partaking mainly of the nature of an ulceration, which, however, finds expression in no notable subjective symptoms.

TESTICLE.

The testicle is more often affected in the later stages of syphilis than the penis, the virus of the affection producing either interstitial inflammation with infiltration and fibrosis and atrophy and gummata. Both the epididymis may be involved, the sclerous and gummatous process being contemporaneous. Hydrocele often occurs with this; and the testicular lesions of the constitutional disease may be seen as early as the second month or as late as twenty years after the first development of the chancre. Forthwith on the development of epididymitis this structure presents an indolent, non-inflammatory, indurated, sharply circumscribed gumma, usually of the globus major. Simultaneously involvement of both organs may be observed. It is only seldom that we find the epididymis affected without the testicle. It usually makes its appearance towards the end of the secondary stage of syphilis. It may be encountered during the secondary eruptions at any time, and at this period the epididymitis responds promptly to mercury, and a tendency to sclerosis or caseation is not observed when of secondary origination. Occurring during the late tertiary period, it corresponds more closely to the type of the tertiary lesions, that is, tends to break down and ulcerate. Only a small-sized enlargement is observed. There are seldom more than two nodules, which after some months become of almost cartilaginous hardness. In rare instances there may be a number of small nodules, grouped at either end of the epididymis, and middle portion remaining unaffected. It now and then happens that syphilitic epididymitis is acute in its onset and accompanied by inflammatory phenomena. On examination, however, a rounded tumour at the head of the epididymis, or at both the head and the tail, with slight irregular surface, not adherent to the surrounding tissues, probably circumscribed, and without fusion into the tunica vaginalis, point clearly to the syphilitic origination of the disease. It is easy enough to diagnose the lesion. Blenorrhoeal

epididymitis would be excluded by the absence of pain, of tenderness, of involvement of the skin, and of hydrocele, together with the infiltration of the head of the epididymis rather than of the tail. But it may not be so easy to differentiate the condition from tubercular epididymitis, in which, however, the tubercular infiltrate usually involves the caput major, producing a hard, painless induration very like that peculiar to syphilis. This steadily grows larger, presents a more irregular and nodulated surface than does the syphiloma, becomes adherent to the scrotal skin, softens, and discharges to form fistulous tracts. The spermatic cord becomes indurated, the seminal vesicles and prostate gland are generally implicated, and tubercle bacilli can be demonstrated in the discharge in the usual way. In the case of syphilitic orchitis, after the skin and subcutaneous tissues and the bones, this organ is more often affected than any other. It may be affected in the early secondary period, but usually about the third year of the constitutional disease. The lesion may be either sclerous or gummatous, though it must be borne in mind that these two processes run their course side by side, and that, while the predominant lesion may appear as a cellular infiltration of the tunica albuginea and its trabeculae followed by cicatricial contraction, there are small and large gummata present in the testicle. On the other hand, even though the affection appears to be entirely gummatous, it is always associated with a greater or less degree of interstitial orchitis. Whether the lesion is of the sclerous or the gummatous type, its onset is insidious, and is often bilateral. Its evolution is extremely chronic, and it ends in resolution, or partial or complete atrophy, or ulcerative destruction. Injury, sexual excesses, and gonorrhoeal epididymitis all predispose to its occurrence. The commonest variety of syphilitic orchitis is the interstitial or sclerous form. It may be unilateral or bilateral. It is characterised by no symptoms beyond a sense of weight and enlargement of the organ. The latter undergoes uniform increase to two or three times its normal size, forming an indurated and non-sensitive swelling. The epididymis is flattened along its posterior border, so that it becomes difficult to recognise it on palpation. The spermatic cord is seldom involved. The surface of the sarcocele is generally smooth, though it may be nodular or ridged. Testicular sensation is absent. The neoplasm develops slowly, and is not completely evolved for weeks or perhaps months. In this condition it may remain for months, and finally it subsides, leaving an apparently normal testicle, or, in place of resolution, there may be the formation of sclerotic tissuesand complete atrophy, the testicle vanishing and a fibrous mass remaining to represent its former existence with the vas deferens ending in it. Acute syphilitic orchitis is another possibility of this disease; in rare instances this sclerous orchitis presents acute symptoms. The testicle then rapidly swells and becomes oedematous and violent and continuous pain complained of. One organ is usually involved and the acute symptoms disappear in a day or two. The inflamm-

ation comes on without any exciting cause, rarely presents symptoms so acute as those of inflammatory orchitis, and is distinguished from gonorrhoeal epididymitis by the fact that the testicle is primarily enlarged and presents the same form and density as seen in ordinary syphilitic inflammation.of the testicle. Syphilitic orchitis usually spares the tunica vaginalis, or there is only a moderate effusion into it. This is sometimes circumscribed, and may assume the form of a false membrane. In rare cases the organ cannot be felt owing to the abundance of the existing effusion. Testicular affection is in certain syphilitics a gummatous orchitis, the development of gummata being often preceded by the sclerous type of syphilitic sarcocele, though often the disease is distinctly gummatous from its commencement. In place of the general enlargement, or rather accompanying this, distinct nodules, ridges, or neoplasms appear, usually on the anterior surface of the organ. These tumours increase in size. The tunica vaginalis becomes adherent; the overlying skin of the scrotum is infiltrated and reddened, and finally softening and ulceration take place, with evacuation of disintegrated granulation-tissue and gummy pus. The resulting punched-out hollow ulcer has dusky indurated borders, and communicates with a ragged, irregular cavity containing gray unhealthy granulations. The cicatrix left after healing is adherent to the organ. It may happen that the granulation-tissue proliferates somewhat, and forms a cauliflower growth projecting externally and overlapping the seat of the perforation of the skin; the name syphilitic fungus has been applied to this, which consists of two varieties, the superficial and the deep. Both forms start from ulcerating gummata; the superficial fungus commences from gumma of the scrotal tissues or of the tunica albuginea; in tubercle a simulating superficial form is also found. The parenchymatous or deep fungus is usually syphilitic. It originates from gumma of the testicle proper. The granulations grow upwards through the tunica albuginea and the tissues of the scrotum. In the resulting discharge will sometimes be discovered portions of the seminiferous tubules. It is not invariable to have softening and ulceration occur. The gumma may spontaneously, or under suitable treatment, undergo resolution, leaving the testicle to all appearances as sound as before the attack, or crippled and deformed by the contraction of cicatrices. It is easy enough to diagnose a typical syphilitic orchitis, for it usually makes its appearance when the classical symptoms of syphilis are present. Syphilis seldom attacks the spermatic cord; the tubercle bacillus and the gonococcus when they invade the testicle attack the epididymis primarily; tubercle commonly invades the cord, the seminal vesicles, and the prostate gland. Cancer of the testicle may also cause confusion; but, bearing in mind the following points, it and the other simulating affections can readily be differentiated: In syphilitic orchitis there is a history of the parent disease; in encephaloid cancer of the testicle there is no history of any special condition; in tubercular orchitis there is a tuberculous history. In syphilitic orchitis occurrence of the lesion is

observed, most often, in persons about thirty years of age or younger; in cancer any age may be affected; tubercle is seldom encountered after thirty. Syphilitic orchitis begins in the testicle; cancer begins in the body of the organ; tubercle begins in the epididymis. Syphilitic orchitis is located primarily in the connective tissue; cancer commences by the deposition of small nodules in the seminiferous tubes; tubercle exists primarily in the tubules. Syphilis tends to fibrous overgrowth; cancer tends to the formation of patches of softened, white, pultaceous material; tubercle tends to fatty, caseous, or purulent degeneration. Syphilitic orchitis is of slow progress; cancer is rapid in its course; tubercular orchitis evolves slowly. In syphilitic orchitis the skin of the scrotum is seldom involved; in cancer the scrotal skin is finally involved; in tubercular orchitis the skin of this part is involved just before the formation of abscess. Ulceration or suppuration is rare in syphilitic orchitis; ulceration and fungus are common in cancer; suppuration is common in tubercle. In syphilitic orchitis there is a feeling of great weight, with only such pain as results from dragging of the spermatic cord; in cancer the pain is severe and lancinating in advanced cases; there is little pain in tubercle. The swelling in syphilitic orchitis is very hard and uniform; in cancer it is soft and fluctuating; in tubercle it is at first hard, knotty, and irregular. The skin covering a syphilitic sarcocele is purplish, but unaffected; in cancer there is a network of large veins over the surface of the tumour; in tubercle the skin is congested, but otherwise unaffected. In syphilitic orchitis the testicle is of moderate size, rarely exceeding twice its normal diameter; in cancer the organ is very large; in tubercle it is of moderate size. Syphilitic sarcocele is painless on pressure; so is cancer; but tubercular testicle is not infrequently painful when pressed. Both testicles are often affected in syphilis; usually one only in cancer; usually both in tubercle. Fungus is rare in syphilis; always present in the advanced stages of cancer; common in tubercle. Syphilitic orchitis does not discharge or bleed; cancer bleeds freely and has an offensive discharge; tubercle is apt to bleed and has a less offensive discharge. Syphilitic sarcocele lasts several years; cancer is fatal usually in less than two years; tubercle is of several years' duration. Syphilis is curable; cancer is incurable; and tubercle is seldom recovered from. In syphilitic orchitis there is not usually any involvement of the inguinal lymphatic glands; in cancer of the testicle the inguinal, iliac, and lumbar glands and cord are affected; in tubercular orchitis adenopathy is seldom seen. Syphilitic orchitis may be very closely simulated by lymphadenoma, which may affect one or both organs, though generally sparing the epididymis. An oval, hard, indolent, uniform swelling is formed, which, however, is not so hard as syphilitic orchitis. Its surface is always smooth, and does not present the slight nodulations or ridges which are so frequently present in the syphilitic

testicular inflammation. Elsewhere in the body other signs of the lymphadenomatous condition are usually to be discovered. It is sometimes necessary to give considerable study to the case when enchondromatous growths simulate syphilitic orchitis. They form areas of unusual hardness; the growth is frequently much more rapid and usually attains a much larger size than the syphilitic swelling. There is much more local and reflex pain, and mercury is useless. A procees of exclusion must be instituted for the diagnosis of the acute form of syphilitic orchitis; that is, when the possibility of traumatism, of simple inflammation, of gout, of mumps, of tuberculosis, of acute fevers, of violent muscular effort, has been excluded, and other signs of syphilis are to be found, the specific origin of the problematical condition should become apparent. Syphilitic testicular fungus may be difficult to diagnose from cancer or tubercular fungus. The ulcerating cancer, however, involves the epididymis and spermatic cord, affects the pelvic and post-peritoneal lymphatic glands, forms large and indolent tumour, occasions considerable pain, runs a rapid course, is accompanied by great cachexia, bleeds and sloughs, and has a copious secretion of ichorous pus. There is generally cachexia also in the tubercular fungus, which differs from the syphilitic variety only in the fact that the granulations are paler of less vitality, and not attended with infiltration of the skin. Cases of syphilitic orchitis usually do well under treatment, the general health and the sexual appetite rarely being impared. It does not indicate a marked severity of the general disease, for complete atrophy and destruction of the organ seldom occur even when the affection is bilateral, some part of the glandular structure being invariably spared in the worst cases. Atrophy sometimes follows even interstitial orchitis at an early stage. Ulcerating gummata rarely give rise to extensive destruction. The formation of spermatozoa may be suspended, though only until the patient comes well under the influence of mercurial medication.

VAS DEFERENS.

Syphilitic affections of the vas deferens are undoubtedly of rare occurrence. Now and then one may come across a case of nodular and somewhat tender indurations of the spermatic cord together with syphilitic orchitis of the same side and gummatous ulceration of the glans penis. This structure appears, however, to be singularly exempt from the manifestations of tertiary syphilis, at least recorded instances of its affection are rare.

SEMINAL VESICLES.

The seminal vesicles are even more rarely affected than the above. One case has been described of induration of the walls of the sac; another in which a cartilaginous hardening of the walls completely occluded the interior.

PROSTATE GLAND.

Syphilitic affections of the prostate gland are so rare as to be almost unknown; but reasoning by analogy, there is every justification for believing that they do occur.

URETHRA.

The occurrence of chancre in the urethra has already been referred to; otherwise early syphilitic manifestations are seldom seen in this part of the genitourinary tract. On examining the passage with the endoscope one may see the mucous membrane infiltrated in places in a circular form, or only on one or other side, swollen, red, and secreting more mucus than the other parts. Again, there may be circumscribed swellings and redness, together with syphilides of minute size. These papules sometimes give rise to circumscribed erosions. Unless the papular infiltration is extensive there is not much secretion from these lesions. Gummatous affections of the urethra are sometimes encountered. The use of the endoscope suffices for the discovery of syphilitic ulcerations. Gummata of the passage, from the size of a pea to that of a stricture-producing hazelnut, are very seldom seen. Ulcerations of the urethra caused by gummata, which have their seat in the corpora cavernosa, are more often discovered. The urethral caruncle of females may be the seat of a gumma. These lesions occasion stricture sometimes, and other symptoms are copious urethral discharge, which is either pus or serous, mixed with particles of necrotic tissue, or ichorous and stinking. Great pain may be experienced by the patient during the evolution of these affections.

PENIS.

Some space has already been devoted to the consideration of the primary and secondary affections ofthe penile organ. Later on in the course of the disease gummata may be observed. They consist of infiltrations of the size of a lentil to that of a bean or larger, in the glans penis or in the corpora cavernosa, which are usually painless, and are discovered by the patient or his medical attendant only when the organ is casually touched, when they are felt as firm nodules. The gumma occupies by preference the site of the chancre, the remains of the latter very often being converted into serpiginous gummatous ulcerations. The gummata of the glans and prepuce break down early, as a rule, on account of their superficial position, and give place to large, sharply defined ulcers of various sizes, very often in the region of a follicle eating to some depth, and not infrequently taking on serpiginous characteristics. In the cavernous bodies of the penile organ it is common to observe the absorption of gummata and their conversion into callosities; but softening and ulceration may also occur here and occasion large and deep ulcerating cavities, which may perforate into the urethra. If large portions of the corpora cavernosa have been invaded by gumma or the callosity, there will occur after healing, even under usual conditions, but more markedly during erection, a flexure or curvature of the penis, - chordee, in the direction of the affected side, the organ perhaps assuming a circular shape. These lesions are difficult to heal and are not easy to distinguish from the plates of induration occasioned by non-specific cavernitis or fibroid infiltration. The

diagnosis becomes more difficult when the gumma occurs on the site of a previous chancre, or has even directly arisen therefrom, because usually there are still present the relics of the bubo. Penile nodules of small and superficial location are not infrequently mistaken for papules. This mistake has been made when the gummata are ulcerated, since papules, especially in this locality, are also liable to erosions and ulcerations. The presence of either syphilis or non-specific indurated papules would be indicated by one or more hard, painless, slowly progressing nodules, growing in from the erectile tissues of the penis, showing no tendency to ulcerate, and giving rise to no symptoms other than interference with erection. The therapeutic test will distinguish between them. The tertiary phenomena, which very closely simulate various forms of chancre, are more chronic in their course than the chancre, give rise to no adenopathy, and commence as infiltrations which subsequently ulcerate; there is also a history of previous secondary manifestations of the disease or some of its syphilides remaining. The possibility of confusing broken-down gummata for chancroids must also be borne in mind; the history of the case and the other chancroidal characteristics already mentioned will suffice for differentiation. The same is true of cancer of the penis, which gives rise to general affection of the glands, whereas gumma rarely is characterised by adenopathy. Inflammation of the cavernous bodies from a gummatous process may sometimes be mistaken for gonorrhoea; but here the history of the case and microscopical examination of the discharge will solve the problem.

OVARIES.

Syphilitic women not infrequently present ovarian affections, and the frequency of such lesions is demonstrated by autopsical research. It is possible that diffuse and gummatous ovaritis do occur in the tertiary stage of the constitutional disease. There are few distinctive symptoms produced during life, but at necropsies the usual evolution of the lesion is observed. The beneficial effects of mercury in ovarian diseases sometimes would seem to suggest a specific etiology for many of the cases. On the whole, the ovaries are less often affected than the testicles.

FALLOPIAN TUBES.

Syphilitic lesions of the Fallopian tubes seem to be of very rare occurrence, at least so far as clinical symptoms are concerned. After death gummatous infiltrations have now and then been observed, and usually in association with severe and similar lesions elsewhere.

UTERUS.

The possibility of a gumma occurring in the body of the uterus is a mooted point; some observers claim to have found such, whereas others deny its occurrence. Disappearance of some of these tumours under iodides would seem to point to the accuracy of the former observation. Endometritis, metritis, perimetritis, and

parametritis have been encountered in syphilitics-these lesions finding expression in the usual symptoms of the non-syphilitic varieties, and resisting treatment just as stubbornly.

VAGINA.

Chancres of the vagina are extremely rare, and for the reason already pointed out; secondary affections are also uncommon, but mucous patches are from time to time observed. Diffuse gummatous infiltrations of the vagina are sometimes seen extending from the vulva of the rectum, in the latter case giving rise to recto-vaginal fistula. The vagina itself is occasionally attacked by a gummatous process without implication of neighbouring structures. The symptoms are those of a chronic vaginitis; the posterior wall of the vagina is greatly thickened, and ulceration and great destruction of tissue follow in usual course.

VULVA.

Chancres, syphilides, and gummata have all been encountered in the vulva on innumerable occasions. Gummata are apt to make their appearance on the site of the chancre and the syphilides. They are generally multiple, bilateral, exhibit a rapidity of ulceration and extension, and give rise to a thickening and warty growth of the skin such as occurs in elephantiasis. Great cicatricial deformity may remain after healing of lesions of this severity.

MAMMARY GLAND.

Chancres are not infrequently observed in the nipples, in consequence of suckling a syphilitic infant. ~~The skin~~ The skin of the breast may participate in the general secondary syphilitic manifestations, papules being especially prone to conversion into mucous patches or condylomatous processes. Both males and females in the secondary stage of the constitutional disease may in rare instances suffer from acute irritative mastitis; it is an early manifestation of this stage, and as symptoms presents swelling of the breast, a certain amount of pain, and some tenderness on pressure; it is very amenable to mercurial exhibition. Gummatous processes are not infrequently observed in this gland, the same occurring in either a diffuse or circumscribed form. In diffuse gummatous mastitis there is a somewhat dense infiltration of a part or the whole gland, both breasts being attacked simultaneously or in succession. Unilateral affection, however, is the more usual. When the affection is neglected and allowed to proceed to disintegration and suppuration, the skin after cicatrisation becomes adherent to the deeper structures, producing atrophy and deformity of the part. Occasionally only the area of the nipple is involved. These cases sometimes simulate cancer of the breast, from which differentiation may be very difficult. But the effect of specific treatment, the more diffuse character of the syphilitic infiltration, the absence of lymphatic involvement, and the history of syphilitic infection

on some previous date will usually determine the nature of the lesion. Gummatous nodules of the breast - a syphilitic and interstitial and gummatous mastitis - is rather rare, and usually is seen at a late stage of the affection. It is of slow evolution, is apt to ulcerate and discharge, and on healing leaves a permanent scar. In or on the breast is found a hard, painless, non-sensitive, freely movable nodule, which in a few weeks becomes as large as a hen's egg; it softens, becomes adherent to the overlying skin, and on bursting gives vent to the usual gummatous discharge. This lesion may also be mistaken for a cancerous process in the breast. But the effect of specific treatment is marked; gummata do not retract the nipple, they make their appearance usually before the cancer-age, they have a different method of ulcerating, there is no adenopathy, and the history of the case is peculiarly that of venereal disease.

LYMPHATIC GLANDS.

The occurrence of adenopathy in syphilis is well known, inguinal buboes appearing shortly after the inoculation of the poison and the development of the chancre. Wherever irritative syphilitic processes are occurring will affection of the anatomically related glands be observed. Involvement of the glands of the neck, the throat, and submaxillary points to syphilitic lesions of the head, the mucous membrane of the mouth and pharynx, just as enlargements of the elbow and axillary glands are the result of syphilitic troubles on the arms. Enlargements of the mediastinal, abdominal, and pelvic glands would seem to have a close connection with syphilis of the intestines. But the neighbouring lymphatic glands are only very seldom involved in the tertiary lesions such as gummata, when not complicated with suppurative processes. Sometimes the glands are affected even prior to the outbreak of the cutaneous lesions of the disease, so that in the opinion of certain observers the generalisation of the syphilitic virus is the first occurrence after inoculation and via the glands. But the virus of the disease which has become constitutional probably affects the general integument primarily, and occasionally the skin and mucous membranes are very little or not at all involved, in their place the deeper tissues appearing to be attacked by preference. Instead of there being the direct distribution of the virus through the whole lymphatic glandular system, as the above-referred-to observers would have it, when, for instance, enlargement of the glands of the neck occurs without any syphilitic eruption on the head or in the mouth cavity, it is probable that there are irritating syphilitic processes in the muscles, the periosteum, or even the meninges. It is, however, possible that specific processes may occur without involvement of the general integument, the virus probably having entered the glands by the lymph-current as well as by the blood-stream; regarding the former possibility, this is mostly seen during the early stage of the disease. The structural changes in the glands near the chancre have already been described. The irritative lesions occurring after the

generalisation of the specific poison give rise in the neighbouring lymphatic glands, probably not as regularly as the chancre but still often enough, to changes similar to those occurring within the latter. Macules, and especially papules and pustules, according to their localisation, are followed by enlargement of the glands of the neck, throat, and elbows, the axillary and subclavian glands, and also the glands of the thighs and the inguinal region, they have been previously spared on account of the extragenital seat of the chancre. It is, however, also probable that irritative conditions in the deeper-lying tissue may also be the seat of such glandular involvement. It also sometimes happens that in a series of lymphatic glands, situated in the course of the lymph-current, the peripheral glands are more affected at one time, at another the central glands. It is therefore quite possible that the indolent buboes of the inguinal region may not be seen in the case of a penile chancre, the pelvic glands showing enlargement instead. The changes occurring in the affected glands consist at first of an irritative enlargement and hyperaemia, and increased serous exudation, and hypertrophy of their elements, the swollen follicles standing out as grayish-white points. Later the congestion subsides and new connective tissue is developed in the stroma from which an even, whitish, grayish-white, reddish-white, or gray picture is presented. The course of the adenopathy, which is nearly always slow, results in an imperfect metamorphosis with inspissation, to which the name of caseous metamorphosis has been applied. In the case of the groin glands, some of them are the size of an egg and whitish externally, others of a bright-reddish hue, presenting on section numerous caseous foci the size of a cherry or smaller; some of the latter are white and dry, others of a pasty consistence. While, therefore, the cellular hyperplasia attracts attention in the early period, the later affections are characterised by induration, cirrhosis, and caseous degeneration. The capsule of the gland appears little or but passively changed in the course of the disease, and it is only in the scrofulous buboes of syphilis that the connective-tissue framework presents a high degree of thickening and fibrosis. The lymphatic glands in the course of the secondary stage of this disease increase to neoplasms the size of an almond or hazelnut, at times even larger, which are freely movable, quite firm to the touch, and but slightly tender. Those glands which are situated between tense skin and bone, as those on the mastoid process, are, however, less movable and highly sensitive. A gland here sometimes stands out prominently above the others in size; but not infrequently after the generalisation of the infection, there is equal enlargement of nearly all the glands of the affected group. It often happens that all the enlarged glands undergo a rapid diminution in size, and occasionally disappear with the subsidence of the irritative symptoms; often, however, they persist without change for months after the latter have disappeared. Consequently, enlargements of the lymphatic glands are not infrequently seen to exhibit the only, or perhaps the most conspicuous indication of a previous syphilitic

attack. The more remote the date of the latter the less often so otherwise healthy persons suffer from complicating troubles of the neighbouring glands and relapses; and gummatous products also, in such cases, do not usually give rise to enlargement of the lymphatic glands. In cases in which there are enlarged glands with tertiary symptoms, there will usually be found other causes for their occurrence, or the adenopathy observed will date back to the time of the syphilides. These diffuse affections of the lymphatic glands are subject, in cachectic or scrofulous or tuberculous persons, to similar atypical evolution as are the buboes which accompany the chancre. The glands enlarge into strumous neoplasms the size of a walnut or larger, which coalesce and form quite a big cluster; their mobility is early abolished by the adhesions which the capsule of the gland forms with the surrounding connective tissue and the skin; purulent processes and softening then occur in the surrounding tissue and in the gland itself. The skin becomes perforated at one or more points, the glands are bathed in pus, and fistulae develop in various directions. This destructive process is of very slow course. Weakened or dyscratic individuals present the same changes in the lymphatic glands as are observed in gummata; or the occurrence of the latter in the glands leads to their destruction after breaking down and suppurating. Glandular gummata are sometimes seen, and and of an extensive character in the glands of the neck, the tracheal and bronchial glands, in the lymphatic structures of the oesophagus, of the lesser curvature of the stomach, and of the mesentery, as well as in the lumbar and portal glands; the surrounding tissues are usually affected at the same time. The gumma in tense situations gives rise to distinct tumour, which is intimately connected with the parts about and the skin, and in which vessels and nerves are firmly imbedded; the neoplasm is firm, with here and there an occasional spot of softening, and of variable sensitiveness. Softening, however, is usually progressive, the skin also then becomes involved in the destructive processes, and an ulcer forms the base of which is connected with the softened or caseous parts of the gland. Occasionally the bursting of the glandular gumma leads to ulceration of the skin, which then not infrequently assumes a serpiginous character and extends over a large surface. Such gummata are now and then observed in the groin, the thigh, the throat, and the preauricular and orbital regions. There may be only one such gumma in the groin, and in other regions more than one may be observed. This gummatous adenitis is characterised by a very slow course, although a general specific medication in conjunction with proper local treatment may effect a more rapid cure than on those cases of specific adenitis in dyscratic persons which proceed to suppuration. On healing a cicatrix is left which attaches itself to the underlying structures. Relics of the affected glands may here and there be found. There is nothing really pathognomonic in the various symptoms produced by these lesions, and a diagnosis will only be effected by exclusion and the elicitation of a history of antecedent syphilis.

Enlargement of the lymphatic glands is produced by such affections as eczema, lupus, tubercle, cancer, and prurigo; a careful study of the case on the lines suggested is here necessary. Prurigo usually changes the skin on the extensor surface of the upper and lower limbs, particularly of the leg and forearm, in a striking manner; and eczema may do the same.

CIRCULATORY SYSTEM.

BLOOD.

The fact that syphilitics exhibit sometimes at the onset of the disease a peculiar pallor of countenance would seem to indicate that the blood has not escaped the influence of the infecting virus; this change is of the nature of an anaemia or chlorosis, though sometimes a leucocytosis is observed. Syphilitic lesions of the spleen produce alterations in the blood which closely simulate leukaemia, which latter affection is itself not infrequently developed in these cases. The blood-making bone-marrow also does not escape the machination of the syphilitic poison, a lymphoid metamorphosis therein occurring. In some of the reported cases a reddish fatty marrow was found, on others a red lymphoid change, in addition to a considerable amount of lymphoid marrow in caries. There have also been discovered in the bone-marrow of syphilitic individuals nucleated red blood-corpuscles in greater or lesser abundance, as well as cells containing erythrocytes. This occurrence has been explained by some on the hypothesis that in every case of anaemia, though perhaps not without exception, there is an increased functional activity of the bone-marrow. In individual cases this compensatory metaplasia of the marrow may pass into a permanent pathological hyperplasia, and may thus, under certain conditions, give rise to leukaemia. Indeed, experiments have shown that after the introduction of artificial anaemia in certain laboratory animals some of the long bones ~~of~~ contain red marrow, and that there is an enormous amount of nucleated red blood-corpuscles, which in the blood also occur in small numbers. Some observers have contended that there are five kinds of white blood-corpuscles, according to reaction to tinctorial agents, each with characteristic nuclei. The first kind, those with eosinophile cells, are of special importance, an increase in their number always indicating a chronic change in the haematopoietic organs. Especially in leukaemia the eosinophile cells are invariably increased to an enormous degree. Others claim that the presence of cells with neutrophile nuclei is characteristic of myelogenous leukaemia, and that these as well as the eosinophile cells have their origin in the bone-marrow. The importance of the eosinophile cells has been detracted from to a great extent by experiments which demonstrated that these cells are present in non-leukaemia blood up to about a fifth of the leucocytes. Other observers say that they have seen morphological differences between the normally present eosinophile cells and those which are found in the blood ofleukaemic individuals: which assertion is ridiculed by those who hold that eosinophile cells are present only in splenic affections. In untainted persons a variable

proportion of eosinophile cells, up to eleven per cent. of the total leucocytes, have been found. In leukaemia there is, it is said, an absolute, but not a relative increase of the eosinophile cells, which are also present in the blood in certain kinds of cutaneous lesions. From all this it is doubtful if there are any characteristic blood changes in syphilis. Nevertheless certain alterations in its composition have been observed. Some have reported that the diminution in the amount of haemoglobin in syphilis was always greater than that in the number of the red blood-corpuscles, although the latter were also reduced somewhat; the number of leucocytes, on the other hand, varied within normal limits, as did also the proportion of the uninuclear to the multinuclear forms. According to observations such as these, the blood changes in syphilitic anaemia are similar to those encountered in essential chlorosis, in so far that in both the decrease of the haemoglobin is greater proportionally than that in the number of red blood-curpuscles, and so the individual blood-corpuscle contains less haemoglobin than under normal circumstances; to this variety of anaemia the term syphilitic chlorosis has been applied. On the other hand there are reports from various quarters to the effect that under the influence of syphilis there is a rapid decrease in the proportion of haemoglobin, as well as in the number of red blood-corpuscles, and parallel with this an increase of the white blood-corpuscles, amongst them especially of the lymphocytes; and that these changes usually occur previous to the appearanceof the syphilides. A day or two after the initiation of the mercurialisation the proportion of haemoglobin and the number of red blood-corpuscles continually decrease in number. The increase of the red blood-corpuscles is sooner effected than is the return of the haemoglobin to its normal amount. The red blood-curpuscles diminish in number and the proportion of haemoglobin in the blood again lessens, if the exhibition of the metal is pushed to excess. There is also a reduction in the amount of the haemoglobin in the congenital disease. In the severer forms of anaemia the red blood-corpuscles are also lessened in quantity, and megalocytes and micrcytes and nucleated erythrocytes are to be found amongst them. The leucocytes are increased in number, but the myeloplaxes especially so. Certain pathologists have reported in macular and papular and ulcerative syphilitic lesions an increase in the large eosinophile leucocytes, and only very seldom a slight diminution. But in all these cases it is possible that the exhibition of mercury had much to do with the watery condition of the blood. Some have referred the diuretic action of calomel to the inspissation of the blood, and others say that the exhibition of mercurial preparations gives rise to a more or less thickening of that liquid independent of the fluids the patient may swallow in the usual way. It has been found thatsubcutaneous injections of corrosive sublimate solution is invariablyfollowed by primary inspissation and consecutive thickening of the blood, while the rise of specific gravity is frequently accompaniedby a very marked relative increase in the

number of red blood-corpuscles, and each fall in specific gravity by a diminution in the number of these cells. In some of the reported cases the action of the sublimate was such that a reduction in the specific gravity took place directly without a previous inspissation of the blood, but this gave place again to normal conditions after a few days; this would seem to indicate that corrosive sublimate is a blood poison, which directly destroys the red blood-corpuscles. On the other hand, there have not been wanting observers who declare that they were unable to detect any blood changes after subcutaneous injections of gray oil during a period of several weeks. Inunctions have been made in patients who were not anaemic at the beginning of the treatment, in order to demonstrate during the whole course of the several weeks' treatment if there was any deviation in the specific gravity of the blood; only a very slight, if any, deviation was observed; in certain anaemic persons the specific gravity of the blood during treatment rose slowly but steadily, and parallel with it there was an increase of the amount of haemoglobin, but no essential change in the number of red blood-corpuscles could be detected. These observers hold that in inunction treatment the density of the blood and the number of red blood-curpuscles are not essentially affected during the entire course of treatment, continued until all syphilitic phenomena have vanished. In syphilitic anaemia the proportion of haemoglobin may show an increase under mercurial medication; but from this it must not be concluded that it will increase in a syphilitic who is not in an anaemic condition. Various researches made on this question are to the effect that mercury may, when introduced into the system in large quantities in the form of a soluble preparation, alter the density of the blood for a short time. A preparation suitable for this purpose is corrosive sublimate, after the introduction of which changes in the specific gravity of the blood take place in practically every instance. But the specific gravity of this liquid is unchanged by the introduction of even large amounts of other mercurial preparations. There are therefore various facts to be taken into consideration in inquiring into the condition of syphilitic blood, particularly that, although specific remedies favourably influence the condition of the blood, they do so only to a certain degree; and that the composition of the blood may in some way be affected by the kind of preparation and the way in which it is administered. Most syphilitics, then, show signs of anaemia during the course of the disease; indeed, some of these cases are actually in a condition of pernicious anaemia, in which serious affection there is a marked diminution in the proportion of the haemoglobin and in red blood-corpuscles. Further, in this severe form of blood affection the diminution of the haemoglobin does not take place to the same degree as the diminution in the number of the red blood-corpuscles, the colouring matter of the blood being found in the individual corpuscles in rather increased amount. The leucocytes are unincreased, and various other features of the pernicious condition are observed. The establishment of a cachexia in syphilis

gives rise to secondary anaemia, in which condition the red blood-corpuscles are also decreased equally with the haemoglobin; absolute increase of the leucocytes, and particularly of the multinuclear forms, occurs with this.

HEART.

Syphilitic affections of the heart are of rather rare occurrence, though by no means unknown; they were noted by some of the ancient writers on the disease who attributed them to the pernicious influence of the mercury administered for their relief. Syphilitics sometimes suffer from endocarditis, this inflammation of the lining membrane of the organ being limited to a small area or affecting the valves, in which case the inflammation generally extends from the neighbourhood of the valves to their insertions. The valves are then thickened or appear as if pushed aside by the gummata; for the affection is rarely primary in its occurrence, being commonly found about the regions where gummata or patches of chronic myocarditis have developed. When the endocardium of the valves is attacked, insufficiency may result from cicatricial contraction, the symptoms observed being those of that condition or stenosis. Independent syphilitic lesions of the free borders of the valves are extremely rare. Gummata may be found in any muscular part of the heart, in the walls of the ventricles and auricles, in the septum, and in the papillary muscle. In the septum they seem to become more voluminous, forming there nodules of sufficient size to project into both ventricular cavities. Multiple fibrous cicatrices may be produced by a simple fibrous syphilitic myocarditis, in which affection partial aneurysms of the heart have been not infrequently observed. Fibrous, as well as gummatous, myocarditis is usually associated with sclerosing endocarditis or with partial pericarditis. Seldom do we come across a case of independent syphilitic involvement of the pericardium without a lesion of the heart muscle. Syphilitic endocarditis of the coronary arteries has occasionally been found, also disease of the blood-vessels of the heart generally, as a result of which hypertrophy of the organ may take place. Various trivial palpitations and dyspnoeic conditions observed during the early days of the syphilitic attack may be attributed perhaps to involvement of the heart, or at least to a blood change induced by the disease. But cardiac syphilitic manifestations are usually of very late occurrence, the symptoms being those of a chronic myocarditis. Commonly the lesion is unproductive of symptoms; when the affection is fatal only may the presence of cardiac syphilis be noted. During life, however, there may be extreme weakness, palpitation, precordial pain, oppression in the chest, and later great difficulty in breathing. Cardiac dulness may be somewhat increased or may be normal; the cardiac sounds may not be altered or perhaps weakened and muffled or accompanied by a slight blowing murmur; the contractions of the organ are frequently weak and unequal, and the pulse is correspondingly small and irregular. The skin of the body, especially of the face and limbs, is pale and cyanotic;

or there are signs of threatening gangrene in peripheral parts; oedema and dropsy develop; the urine is albuminous;and signs of insufficiency of the valves of the heart may or may not be observed. For the recognition of cardiac syphilis it is necessary to rely upon the history of the antecedent disease and the presence of syphilitic lesions in other organs; when such are absent it is not infrequently purely a matter of conjecture. The patient usually dies, though it is said that a few cases have recovered under suitable treatment when taken at an early stage.

ARTERIES.

Though now and then observed in the first few months of the constitutional disease, syphilitic involvement of the arteries is generally of tertiary occurrence. Cases of syphilitic arteritis may be either acute or chronic, the pathology of both being alike. There is at first a cellular infiltration, usually beginning as a periarteritis and involving all the coats of the vessel, causing its walls to become irregularly thick, hard, and inelastic, and narrowing or quite obliterating the lumen of the vessel. Even should the infiltration not mechanically close the lumen of the vessel, as a result of endarteritis, thrombi frequently form, and thus cut off the circulation through the affected part. There are two varieties of endarteritis, the sclerous and the gummatous. The former is much more common than the latter, and in it the infiltrate is changed into fibrous tissue, producing whitish, opaque patches of hardening, which appear as disseminated plaques or as small nodulations, with the entire circumference of the vessel generally implicated in the process. It is very seldom that gummatous endarteritis is observed; it is invariably associated with the sclerous degeneration and with periarteritis, and the disintegrated and cheesy contents of the typical gumma are presented on section of the part. The smaller arteries, and particularly those of the brain are affected by syphilitic arteritis. The formation of aneurysm is strongly predisposed to by the weakening of the walls of the vessel and the increase of blood-pressure from local obstruction to the circulation. The location and extent of the disease, the size of the affected vessel, and in the case of the smaller vessels the importance of the organ affected, will all determinate the symptomatology of syphilitic arteritis. The usual result of the changes described above is that the walls of the blood-vessels lose their elasticity partially, or become considerably thickened. Consequently, there is sometimes enlargement, at other times narrowing and obliteration of the lumen of the vessel. Although both results may occur together, enlargement affects more often the larger vessels, narrowing the lumen more frequently the medium-sized and smaller arteries. The result is that in the course of the process there may be sometimes the formation of an aneurysm, sometimes the symptoms peculiar to obliteration of the vessels. Arteritis resulting in narrowing and obliteration will be less striking, the smaller the region supplied by the vessel, the less important is its physiological function, and moreover

the more favourable the conditions are for the development of the collateral circulation. The latter develops almost without interruption during the slow evolution of arteritis. Impairment and abolition of the circulation, with consequent diminished nutrition and necrosis, occur if the terminal arteries are affected or if the disease affects numerous vessels. In the case of the umbilical and placental arteries, there may occur foci of softening in the brain or heart, and ulcerations of the skin and mucous membrane. The production of haemorrhagic syphilides may be due to the fact that syphilitic arteries also causes occasional fragility of the walls of vessels. Haemorrhagic forms of syphilis are not infrequently observed in nursing infants. Haemorrhages in the brain sometimes occur; and cases have been recorded of profuse metrorrhagia shortly after delivery in syphilitic women, and believed to be due to the existing disease. In other cases it has been found necessary to tie the common carotid artery on account of violent bleeding from syphilitic ulcerations of the larynx and pharynx. Ischaemia of the brain due to syphilitic arteritis is characterised by frontal headache, followed in weeks or months by epileptiform attacks, hebetude, somnolence, hemiplegia, particularly marked in the upper limb, usually attacking the right side, accompanied by aphasia, and sometimes occurring without loss of consciousness, and ending in death by coma. Aneurysms have no special symptoms pointing to their syphilitic production. They usually occur in the brain, and give rise to much the same symptoms as just described in the case of arteritis from syphilis. Aortic aneurysm is sometimes occasioned by syphilitic processes. All these cases usually die, because symptoms seldom become prominent until sclerosis is well advanced, and particularly in the case of the brain, because the alterations in the substance of the organ are of hopeless import. The effect of specific treatment in other situations may or may not be satisfactory.

VEINS.

The veins now and then show syphilitic lesions, which are generally due to extension from a syphilitic neoplasm lying near the vessel; they are therefore generally encountered in the tertiary stage of the disease. Gummata and phlebitis are the forms of lesion observed; and the symptoms of the same will depend, as in the case of the arteries, upon the extent, localisation, and time of development of the lesion.

THYMUS.

Collections of pus are sometimes to be found in the thymus of newborn infants with inherited syphilis; with these, however, the ordinary secretion of the gland must not be confused. The occurrence of gummata in this part is probable, and now and then a case has been observed.

THYROID.

Enlargement of the thyroid gland has now and then been observed, there being either a varying degree of fatty

degeneration or gummatous infiltrations; such circumscribed infiltrations are about the size of a chestnut and somewhat sensitive to pressure. Gummata of the thyroid are usually found in association with the like lesion in other organs, particularly in the hereditary cases.

SUPRARENAL CAPSULES.

Gummata have here also been found, together with the ordinary symptoms of Addison's disease. The part may be in a state of total fatty degeneration.

PINEAL BODY.

Gummatous deposits are said sometimes to occur in the pineal body, most of the cases being reported by foreign observers.

MUSCLES.

There is every probability that the painful sensations experienced in the muscles early in the syphilitic attack are due to an acute irritative myositis. The symptoms are those of a slow and rather chronic muscular rheumatism. The dull pain which the patient feels is increased by pressure and movement, the condition in certain instances being the cause of great suffering. The biceps and triceps are the most frequently involved, and they now and then show irritative contraction which may interfere with the function of the part and resist topical applications, though disappearing quickly enough under mercury. The muscles are affected in the tertiary stage of syphilis by either a chronic interstitial myositis or a gummatous inflammation of muscle. In chronic interstitial myositis we have a cellular infiltration of the muscular fibres; the infiltrate becomes subsequently converted into connective tissue with the ultimate production of muscular contractions and atrophy. The lesion is most conspicuous in the bellies of the muscles; the anal sphincter and the biceps of the arm are most often involved, though now and then we find cases of contractions of the sterno-cleido-mastoid, pectoralis major, rectus abdominalis, masseter, and numerous other muscles. The patient experiences great pain; there is slight tenderness, together with limitation of motion and great swelling, with atrophy and shortening subsequently occurring. The condition, when unaccompanied by other and more characteristic signs of syphilis, may simulate muscular rheumatism. The syphilitic affection is, however, unattended by constitutionalsymptoms or articular involvement. It developswithout apparent cause. It is slowly and persistently progressive, and is shortly accompanied by contracture. Besides, it shows marked preference for certain muscles. In all these points it differs from the simulating affection, and there is always the therapeutic tests to determine the diagnosis. Gummatous myositis differs from that just described only in the facts that it is circumscribed, forms a distinct tumour, often involves neighbouring parts, and exhibits a tendency to degenerate, soften, and discharge to the exterior. The lesion usually occurs

late in the disease, except in cases of the syphilis of the malignant type, when the affection may be of early occurrence and very apt to suppurate. As a rule, gummata evolve as painless, slowly growing tumours, seated at the point of insertion of the muscle or in its belly, movable with the latter, but fixed when it is strongly contracted; exceptionally when infiltration is rapid, there may be great pain and tenderness. The neoplasm usually reaches the size of a fist. Sometimes it attains the size of an infant's head; it may then simulate malignant disease so closely that the therapeutic test alone will enable a diagnosis to be made. These gummata, which affect mainly the trapezius, pectoralis major, gluteus, biceps, and lingual muscles, are absorbed, soften, or become converted into dense fibrous masses. If treated early, the prognosis is favourable; otherwise a guarded opinion must be given.

TENDONS.

Syphilitic affections of the tendons are not infrequently observed on the course of syphilis - the resulting inflammation being of the acute, the chronic, or the gummatous type. The first-mentioned variety may occur during the early secondary period, and is characterised by effusion, tenderness, and swelling along the course of the tendon. It quickly disappears under mercurial treatment. Several tendons may be affected simultaneously, and there may be great pain and tenderness, and an associated syphilitic synovitis with pyrexia. Females are more affected than males with this disease. In rare instances chronic teno-synovitis develops, characterised by effusion and crepitation along the course of the tendon. It is accompanied by some thickening of the sheath, especially observed about the extensor tendons of the fingers and toes and the tendon of the biceps of the arm. The affection is generally painless and yields slowly to mercury; it has the same symptoms as the non-specific form of the disease. Gummatous tenosynovitis if characterised by the development of gummata in the sheath of a tendon. They are painless, and are either round or spindle-shaped. Exceptionally the gumma appears in the form of a diffuse infiltration. Treatment is curative. They are mostly found on the tendo Achilles and the biceps tendon. The diagnosis is generally facilitated by the presence of gummata elsewhere, particularly in the muscles. In the absence of these and other signs of syphilis, mercury should be exhibited and the effect noted. The development of the gumma usually distinguishes it from other tumours, enchondroma, for instance, since sooner or later the gumma softens and breaks down into a characteristic ulcer in the absence of mercurial medication.

BURSAE.

Syphilitic bursal affections are now and then observed, inflammation or gummata being the lesions seen. Various bursae are affected and the symptoms are of the usual sort.

FASCIAE.

The fasciae are sometimes infiltrated as hard, slightly tender nodules in early syphilis. Large gummata sometimes also occur, generally, however, involving the neighbouring tissues.

BONES.

Osseous diseases are amongst the most common manifestations of constitutional syphilis; and after the skin and mucous membrane of the bones are more often affected than any other tissue of the body. Signs of implication of the bone may appear very early, sometimes even before the outbreak of the exanthems. Usually, both in time of appearance and type the lesions are tertiarily inclined. Syphilitic attacks on the bones are predisposed to by certain cachexias which are liable to be attended by lesions of the bones, as gout and rheumatism, and particularly traumatism; such factors may be slight and unnoticed but nevertheless are of recognised influence. On account of their exposure to injury, superficially situated bones, such as the frontal, clavicle, sternum, radius, ulna, tibia, etc. are more often attacked. During the course of the syphilitic attack the periosteum is commonly affected; and the resulting lesion may be either a simple periosteal lesion or a gummatous one. There are various endings to simple periostitis. The periosteum becomes thickened over one or more circumscribed portions, more rarely over larger surfaces, by a new growth deposited beneath it, which at first is intimately adherent to the periosteum and only loosely lies over the bone, but which frequently goes on to ossification and in that case seems to be intimately moulded to the bone as an osteophytic formation, or which forms a hemispherical or semioval prominence. If, in the latter case, the deposit has united to the bone, only the constriction existing at the base will point to the fact that the newly formed mass of bone has not originated from the bone, but from the periosteum, and has subsequently become welded to the bone. The neoplasm is occasionally characterised by a peculiar density, and its composition is frequently the same as that of the bone to which it is attached. These are the syphilitic products that have long been known by the name of tophi. In other cases there is a marked thickening of the bone occasioned by the extension over large areas of this offifying syphilitic periostitis. Under mercurial exhibition, all these periosteal deposits may disappear up to a certain point. If absorption begins before the periosteal product has gone on to ossification, the latter may entirely disappear. On the other hand, purulent disintegration of the periosteal swelling will occur in badly-nourished or scrofulous or tuberculous persons when such other factors as traumatism, etc., obtain, and thus occasion caries of the upper parts of the growth. Gummatous periostitis sometimes occurs, which is characterised by the occurrence of elastic, soft, periosteal neoplasms. As the trouble here is also caused by inflammatory irritation of the periosteum, only with the difference that the product of inflammation takes on

the character of a gumma, - a lesion which is encountered also in other tissues, - we may speak of a gummatous periostitis. In this condition there are circumscribed hemispherical or flattened prominences which are sometimes hard, sometimes rather of a mucoid consistence, soft and elastic, and giving the impression of fluctuation. The gummatous product arises especially from the inner surface of the periosteum, but involves at the same time the bone, in which there is a depression corresponding to the gummatous swelling, and gummatous plugs are also seen passing into the Haversian canals. The periosteal gumma seems also in this part to be imbedded in the bone, from the fact that the gummatous product has apparently eroded this tissue. But alongside this destruction of bone there are in the parts adjacent to the base and the periphery of the gumma, a sclerosis and hyperostosis of sometimes no inconsiderable intensity. The affected part may have a sunken appearance, if the periosteal gumma proceeds to absorption, which often occurs, and is usually accompanied by fatty degeneration. This may be due to the fact that the overlying skin has been stretched and thinned by pressure; but even when no such change has occurred this depression will still be found because of the loss of substance in the underlying bone. The wall occasioned by the formation of bone at the periphery will remain for a considerable time and serve as a characteristic mark of the depression left after the absorption of a periosteal gumma. Even this new growth is absorbed at length. Perforation of flat bones may thus readily occur, if the periosteal gumma has been present in corresponding places on both surfaces. As these pit-like indentations and perforations occur without the formation of pus, that is in a dry manner, as it were, the condition has been termed caries sicca. The periosteal gumma in certain instances, however, becomes liquefied and leads on the other hand to superficial caries and necrosis, on the other to an absorption of the overlying soft tissues, which are frequently the seat at the same time of a gummatous infiltration; in this way is formed a fistulous opening leading to carious and necrotic bone. Should the lesion not extend, the superficial layers of bone will be exfoliated, and there will result an osseous cicatrix into which are tensely drawn the cicatrised soft parts. It is not probable that a periosteal gumma may become ossified, and that therefore the gummatous periostitis may be an ossifying one. The elements constituting the gummata are so characteristically frail that any degree of organisation can probably be excluded. The gumma may possibly excite a new formation of connective tissue, which, as in the case of the liver and the lungs, becomes a callosity, or an osseous new formation, but it is improbable that it can itself become transformed into connective tissue or bone. In the case of the bones, just as in the structure we have just described, there are lesions peculiar to syphilis sometimes observed: for example, a simple syphilitic ostitis or osteomyelitis, which is analogous to the non-specific lesions, and a gummatous ostitis or osteomyelitis, in which, in which the inflammatory growth assumes the character of a gumma.

Thickening of the affected bone is in the majority of instances occasioned by the occurrence of simple ostitis. This thickening, however, is not always permanent, but on the contrary absorption usually occurs after the osseous process has run its course, and the loss of bone tissue resulting therefrom is not confined to the osseous deposits alone, but also involves the healthy portions, so that the bone may ultimately become osteoporotic. Caries or necrosis may be the termination of the ostitis, and especially of the osteomyelitis. The gumma, with its accumulation of cell within the bone or its medullary cavity, is characteristic of syphilis. Unless carefully looked for they may not be discovered. The gummy deposit makes its appearance in the bone usually iu small foci the size of a pinhead to that of a hazelnut, which are at times of a rounded form, at other times having offshoots. The part surrounding the induration is always indurated, while the growth of the individual focus is always accompanied by rarefaction and absorption of the osseous tissue. Absorption usually occurs when the conditions are favourable, i.e., when the deposits are not very large, even if numerous. The parts first attacked become osteoporotic, and as there is sclerosis of the parts surrounding the gummata, after the process has undergone its evolution both hypertrophic and atrophic areas of bone are to be found. A portion of the gumma will, however, remain behind should the process of absorption be incomplete. The larger the gummatous deposit, the more likely is this to happen, because in this case there will be present a disproportion between the absorbing surface and the mass to become absorbed. The fact that the gummy mass within the bone induces an osseous sclerosis in its vicinity still more diminishes the power of absorption. Very often the gummy infiltration occupy the osseous tissue in such a manner that they surround a portion of the bone in the form of an island. The nutrition of such a bony island is cut off by the intervening gummatous matter and the part becomes necrotic. Smaller sequestra, and occasionally some larger ones, are apparently destroyed by the erosion induced by the gummata; large sequestra will require removal. The portions of bone which become necrotic after a gummatous ostitis are markedly characterised by the fact that they are traversed in many directions by small channels and holes, as though eaten out by worms. The reason of this is that the gummatous deposits which are the cause of necrosis also penetrate to the portion doomed to necrosis and so impress the marks of the past disease upon the sequestra. Necrotic parts remaining after non-syphilitic ostitis have a smooth surface as a rule, and do not present any marked changes. The involucrum in gummatous ostitis is also perfectly characteristic; the walls of the cavity present marked induration, and the opening or mouth of the involucrum is surrounded by a bony wall. After the sequestrum has been expelled, the cavity is very imperfectly filled up; the defect is consequently very conspicuous, and is still more distinctly thrown into prominence by the osseous wall enveloping it. The gummatous infiltration in ostitis

does not proceed to ossification. Chronic lesions, which are mainly located in the skin, may also affect the underlying bones - favus for instance. The underlying bone is either stimulated by the skin disease to produce vegetations, or the parts under consideration become atrophic. The involvement of the bone is, however, much clearer when the soft parts which cover it proceed to ulceration, denuding the bone as disintegration progresses, and causing necrosis or caries, if only superficially. From this standpoint the cutaneous and submucous, as well as the mucous and submucous, gummata must be considered, especially when they are situated at no great distance from the bone. When such gummata ulcerate, denudation and caries may occur. The inner bones of the nasal cavity are especially liable to this, with resulting destruction and deformity. There is also a form of atrophy which may affect the whole osseous system or only single bones. This is probably not connected directly with the syphilitic process, though occurring in individuals who have, or have had, the disease. Just as in other affections, a cachexia is produced when a syphilitic infection is of long duration and lowers the nutrition of the patient's system; in the course of this a constitutional depravity is formed, which occasionally also extends to the bones. The latter lose their firmness and elasticity, the least forcible exertion is sufficient to break them; in short, they are affected with osteopsathyrosis, or fragility of the bones. This condition affects a large number of bones, particularly the long bones. Fluoride of calcium is said to be markedly diminished in these fragile bones. Most likely of syphilitic origin is a peculiar thinning, leading here and there to perforation, which occurs as a symmetrical atrophy of both parietal bones and sometimes also of the occipital bones. In view of the fact that syphilis not infrequently gives rise to tabetic and mental affections, the fragility of the bones peculiar to those conditions may in this disease also be observed. The clinical phenomena induced by syphilitic affections of the bones do not invariably admit of the artificial arrangement necessary for their theoretical consideration, the bone and periosteal symptoms not infrequently merging into one another. In the simple or purely irritative variety of periostitis frequently encountered there occurs a painful flat swelling, which, when the bone is situated superficially enough, is seen to be diffuse and of greater or less extent. The general condition is, however, not impaired, even in an extensive periostitis, to such a degree as is usually the case in periosteal inflammations; the result of this is that the affected individual is able to go to work as usual, which is remarkable considering the nature of the lesion, which may be an extensive periostitis of the tibia or a painful thickening of the periosteum of the skull. The inflammation invariably is located in the inner surface of the periosteum; but is possible, of course, that there may be a concentration of the disease upon the external surface of that structure. Absorption usually occurs if proper treatment is extended to a periostitis

in which there is no increase of the swelling after the disease has existed for some time. Ossification, even when there are no clinical signs of such commencing, will ultimately occur if the pains diminish without a decrease at the same time of the periosteal swelling, or if an increase of the latter is seen while the pain decreases. Only in such cases as the affection has lasted for a few weeks or months will we observe, in parts accessible to examination, either an extensive area of thickening or multiple small excrescences which are sometimes rounded, sometimes pointed, or isolated hemispherical or semioval bony prominences. As a result of these disturbances changes occur which are dependent in part on the increased weight of the bones, in part on the pressure which the diseased products exert on the neighbouring vessels, nerves, and other structures. It is a striking fact that these various areas of periosteal ossification may still, up to a certain degree, undergo absorption. The thickened bone decreases more and more in size and becomes porous, the bony points and excrescences become rounded and flatter. The feeling of weight then gradually disappears, and also other symptoms produced by pressure are no longer felt. Those cases are very remarkable in which the ossifying inflammation of the periosteum approaches the insertion of muscles, and in which the ossification also extends farther, even to the substance of the muscles, so that entire muscles have, in rare instances, become ossified. This affection, known by the name of myositis ossificans, which occasionally makes its appearance after great exertion, - at other times, again, myositis ossificans progressivea, as a result of a disease of the central nervous system, - seems to be frequently due to syphilis. Many other still unknown factors, however, may be considered. Iodide of potassium may prove curative in these cases. Should the inflammation of the periosteum proceed to suppuration, pain is severe only when the inflammation runs an acute course. The periosteal inflammatory swelling is then only painful and exquisitely tender on pressure. The skin, which is involved in the inflammation later on, also becomes swollen through the collateral oedema, is reddened, but takes on a bluish colour and becomes thinned where the convexity is greatest. After the pus has once perforated the periosteum, the pain suddenly decreases, but only for a short time; it is totally abolished when the skin also gives way in one or more thinned places and the pus is thus enabled to make its exit. Should a probe be now passed through one of the openings in the skin, which corresponds to the periosteal perforation, the rough surface of the bone is easily reached, and if proper curvature is given to the probe, may be explored in its whole extent as far as the periosteum has been reached by the pus. If the pus is enabled to flow off in its own channels or is led away by artificial drainage, the periosteum which has previously been raised becomes adherent throughout its greater part by means of granulation. In those parts, however, in which the periosteum has been destroyed or goes on to suppuration, granulations spring from the bone, sometimes

after previous exfoliation of one or more of the outer layers, and furnish material for a cicatrix, with which, after completion of healing, the cicatrix of the soft parts and of the skin becomes intimately adherent or attached by a cicatricial band of variable length. A slow course is, however, not infrequently run by a suppurative periostitis. In that case reaction is slight. pain is insignificant, and the pus does not so readily gravitate to the dependent parts to form a cold or gravity abscess; these abscesses do not invariably perforate externally, and the pus is absorbed when the case is properly looked after. Gummatous periostitis is characterised by the presence of one or more circumscribed infiltrations, the size of a chestnut or larger, accompanied by great pain. These are firm in the beginning, but after a while when softening and liquefaction of the infiltration have occurred, the sensation of fluctuation becomes prominent. The skin puffed out by the periosteal gumma if the latter is situated superficially, but retains its colour for a considerable time. If the gumma proceeds to absorption, which is usually the case, the skin becomes only slightly discoloured. If the gummatous infiltration breaks down, however, the skin will be also markedly discoloured and becomes thinned. It finally gives way at the most prominent point and discharges a slimy, ropy fluid, more or less turbid from the admixture of pus and blood, in which a few shreds of necrotic tissue may be found. The liquefaction and disintegration of the gumma proceed from its centre; and it may happen, therefore, that the swelling does not collapse in spite of the perforation, for the reason that the marginal portion of the gummatous infiltration has not yet become liquefied. There occur also an increased deepening and enlargement of the ulcerating cavity, so long as any disintegrating gummatous infiltration remains. Only after the peripheral portion of the gumma is destroyed will the walls of the ulcerating cavity collapse; this diminishes now in so remarkably rapid a manner that only a few granulations are necessary to fill out and permanently cicatrise it. In nearly all cases of peritosteal gummata the bone is also diseased in the parts corresponding to the periosteal gumma, and it participates in the absorption as well as the disintegration of the gumma. One therefore finds, nearly without exception, no matter whether the morbid product has disappeared by absorption or by ulceration, a pit-like depression in the bone at a part corresponding to the seat of the periosteal gumma. On the other hand, however, the gummatous affection has excited a sclerosing ositis in its immediate neighbourhood, and this is accompanied by bone formation. A more or less broad osseous wall consequently surrounds the depressions left behind after the healing of the periosteal inflammation. It is not infrequently impossible to tell clinically whether we are dealing with an inflammation of the bone or its marrow, or an ostitis or an osteomyelitis or gummatous origin. The lesion of ostitis or osteomyelitis is usually of slow evolution, occasions only a dull pain in the deeper parts, which, however, gradually increases in the further course of the

disease, and is accompanied by marked nocturnal exacerbations. It is not often that the pain is of such intensity that functional disturbances of the diseased bone are produced. The patient usually does not appear to be seriously indisposed. Objectively, changes in the bones or soft parts, even in cases in which the affected bone is superficial, are usually slow in making their appearance. But the existence of the disease is suggested by this continuation and increase of pain down in the interior of the bone, as well as the absence of demonstrable morbid changes in the periosteum and the soft parts. The subsequent symptoms will differ according to the outcome of the disease. If the ostitis leads to sclerosis, a sensation of heaviness in the affected bones will be added to the original symptoms of indistinct character. When, however, this induration leads to a narrowing of foramina, canals, or even cavities, and thus to a compression of the contents of same, pressure signs in the affected parts will be added to the otherwise simple symptomatology. The affected member, in such as the sclerosis affects one of the large bones and marked thickening exists, will appear heavier to the patient, and its functions may also occasionally be interfered with. But even when very pronounced sclerosis is present, the annoying symptoms will disappear after a time, not only because the patient becomes accustomed to them, but because the diseased bones in reality also become lighter and the foramina wider, as the newly deposited osseous material is again in part absorbed. In exceptional instances, however, absorption sometimes is greater than the hyperplasia, and then osteoperosis, and with a still greater amount of absorption, fragility of the bones will occur. It is seldom that we see a simple inflammation proceed to abscess formation.
It not infrequently happens that gummatous ostitis and osteomyelitis are unaccompanied by symptoms, though now and then pain is experienced. In view of the rarity of osteocopic pains, it is not improbable that syphilitic ostitis, especially when it has ended in absorption, is very often overlooked both by the patient and the physician. Sometimes the exercise of careful percussion will result in our being able to accurately determine the location of the morbid focus in the bone, and to reveal the existence of tender spots in the tibia, the calvaria, or other bones, even when the patient has made no special and suggestive complaint. A gummatous ostitis is, however, very often ushered in with a pain localised in certain parts, occurring after exertion or in the form of nocturnal exacerbations. When the periosteum and surrounding soft parts are involved, these parts are welded together into one resistant tumour. The gummatous infiltration sometimes occasions, when its seat is central, a thinning of the peripheral parts until only a bony shell is left, which becomes distended by the presence of the enclosed product continually enlarging, and crepitates when pressure is made, - spina ventosa; or osteoporosis is developed, so that a bone thus affected can be broken by a comparatively trivial blow. Gummatous ostitis is probably responsible therefore, for not a few of the cases of so-called

spontaneous fractures. Forthwith on the absorption of a gumma, a disappearance of the symptoms will be observed. A rarefaction remains behind which alternates with areas of greater density in the neighbourhood of the originally infected foci. If the rarefaction is extensive, the bone will retain a certain fragility, even after the gumma has healed; even at this stage, then, spontaneous fracture may occur. The loss of bone originated by the gummatous infiltration may, however, also show itself as a shortening, or even entire destruction, of a bone, as in the case of the fingers, which are sometimes greatly damaged in this way. The suppuration accompanying the inflammation of demarcation, when gummatous inflammation of a bone leads to necrosis thereof, will occasion pain according to the degree of tension present. Obstruction to the flow of pus may, however,also dispose to erysipelas and inflammation of the deeper structures, and so give rise to a peculiar symptomatology. When the pus has free drainage, which is sometimes facilitated by ulceration of the soft parts, the graver symptoms usually disappear, and only the suppuration remains copious, the pus being stinking, until the bone is completely exfoliated and reaches the surface. Only now may healing be expected, which is usually accompanied by adhesions of the soft parts to the bone. Smaller pieces of bone are consumed, eroded by the neighbouring granulation cells, and are apparently dissolved, while larger sequestra present the worm-eaten appearance mentioned above. Flat bones become thinned by this process, or even perforated, while trivial injuries may give rise to fractures in the long bones which have lost their rigidity through this disease. There being no really sharply defined boundaries between the several periods of syphilis, it is not strictly accurate to regard these affections of the bones and periosteum as characteristic of the tertiary stage of the disease. Indeed, even involvement of the osseous system is not always indicative of syphilis of long standing, as affections of the bones and the periosteum often enough make their appearance when the disease has been only a short time in existence. One author, in fact, places affections of the bones amongst the first symptoms of the constitutional disease; and he tells us that there existed, during the course of the chancre on the penis, in skin, mucous membrane, and bony syphilis a proportion of eighteen, twelve, and seven. Here, as well as in syphilis generally, it is the rule for lighter forms to make their appearance in the first period of the constitutional disease, while graver forms are seen at a later stage. Various osseous affections have been observed even in the primary stage of syphilis or soon thereafter, the constitutional symptoms being occasionally ushered in by syphilitic bone troubles. So it comes that, at different periods of the disease, we find the bones affected, and also encounter other symptoms of the malady. It may, however, much more frequently happen that syphilis of the bones occurs in the absence of recent signs of syphilis in other organs. It is in the osseous system especially that the disease

may occur most frequently alone; indeed, it is encountered here alone even oftener than in the case of the general integument of the body. None of the bones are immune from syphilitic lesions; even the hyoid bone may become carious and necrotic in this disease. Nevertheless, some bones are much more apt than others to become affected; the occipital and temporal bones are seldom diseased, whereas syphilis is commonly observed in connection with the frontal bone, the parietal bones, the bones of the nose and of the hard palate. The long bones are also often affected, and those of the legs and forearms seem to be more frequently attacked than the femur and humerus. The clavicle, and secondarily the ribs, are very often syphilitic, while the vertebrae, as well as the short bones as a whole, are somewhat less frequently involved. The diaphyses of the long bones are oftener syphilitic than the epiphyses. Still the joint may become invaded by the syphilitic process owing to the development of gummata on the articular surfaces. The whole of the bone is attacked en in exceptional instances; generally the lesion is localised to a few foci, which, at the same time or successively, develop in one or more portions of the bone. The reason for this is difficult to find. It would seem, in view of analogous conditions on the skin and mucous membranes, that those bony parts which are more exposed to external injury are also more disposed to syphilitic affections; and, as a matter of fact, such superficially situated bones as the frontal, tibia, clavicle, etc., are much oftener attacked than the others. Certain injuries have been known to produce fractures in syphilitics after the occurrence of the usual osseous changes. These fractures sometimes are difficult to heal, this being probably due to the development of fresh gummata at the point of fracture; in other cases the best treatment gives no result and the break remains ununited until mercury or iodide or potassium is exhibited. The administration of mercury has been from time to time accused of producing the osseous lesions so commonly observed in this disease. The idea is, however, a mistaken one; for bone lesions have been seen in patients who have never received the metal, and not infrequently such cases have been most intractable. The less opposed to the administration of mercury content themselves by affirming that the drug favours the appearance of osseous lesions. It is nevertheless true that the careless exhibition of the metal gives rise to osseous changes; but these are represented by either a fragility as the result of what has been termed a probable mercurial dyscrasia, or by necrosis of the jaw after a severe attack of mercurial stomatitis. Affections of the bones, however, which can be compared to syphilitic ostitis and periostitis, have not been observed in pure hydrargyrosis. Overdoses of the metal may perhaps in a sense predispose to bony changes. Specific osseous diseases are only rarely of short duration, and then chiefly in periostitis occurring soon after infection. One may see the absorption of periosteal swellings, which had made their appearance together with other syphilitic symptoms, within a few days and

in the absence of specific treatment. As a rule, however, these lesions, especially when located in the bones, last for weeks or months or perhaps years. The remarkably slow course of the affections which give rise to thickening and condensation of the bone or to caries is quite characteristic. Still, it is possible that the repeated and successive development of gummatous foci may prolong the osseous manifestations of the disease. It is by no means invariable to find great pain in syphilis of the bone and of the periosteum; and in such cases seldom are serious constitutional symptoms observed. Despite the fact that the pain is dependent on the size of the exudation, manifest swellings are not always accompanied by pain, and great tenderness is often observed in bones which present no swellings. There is no kind of feeling which may be termed a pathognomonic syphilitic pain; the sensation complained of is sometimes described by the patient as boring, beating, or sawing, at others as tearing, dragging, or simulating some other sensation. Some authors make much of the nocturnal character of the syphilitic osseous pain. But a nocturnal increase of pain is not infrequently observed in bone affections of non-syphilitic origin; there is therefore nothing absolutely characteristic about it, though it is quite true that syphilitic pains become aggravated at night. Syphilitic affections of the cranial bones are very commonly observed; and in most cases of syphilis the condition of this part is carefully inquired into. So long, however, as the morbid process is confined to the bones alone, no serious results are seen. This, however, is partly dependent on the kind and extent of the process and partly on its location. Periosteal swellings situated on the external surface of the bone, as a rule, cause only local disturbances, but when the tophus involves the inner surface it may threaten life. But all these cases do not die; for there are several cases on record in which syphilitics suffering from cerebral symptoms, caused by exostoses of the cranial bones, have been relieved not only of the cerebral symptoms, but also of the exostoses which were their cause. Gummatous ostitis ending in necrosis must be regarded as the most serious of all. Curiously enough, extensive affections of the skull occasionally run their course in a latent way, so that the gummatous affection of the bone is undiscovered until the patient comes to autopsy. As a rule, however, the soft parts are destroyed sometimes to a slight and sometimes to a large extent, and the bone is laid bare as a blackened mass. The course of the lesion is an exceedingly slow one. If the necrosis involves the entire thickness of the bone, large holes are frequently left in the skull. Thus, after the removal of the necrotic plate of the bone, we may observe the broad pulsating cerebral surface covered only by the meninges. Even great defects have, however, been known to heal. A firm cicatricial tissue is formed, and becomes intimately adherent, partly to the meninges, partly to the bone and the borders of the soft parts. The cerebral pulsations are still, however, seen through this tough cicatrix to a certain extent. Here the skull ultimately become flattened on account of the contraction

of the cicatricial tissue. Despite the considerable time they last, these cases of syphilitic necrosis often end unfavourably, so that active interference is not an urgent indication. Sometimes enormous areas of the skull bones are thrown off, and yet the patient survives. Of serious import, however, are the cases in which the necrosis of the skull gives rise to inflammation of the meninges with grave cerebral symptoms; the same is true of gummata which press on the brain. These cases often die, or have paralysis or epilepsy, or even go mad. Operation is here productive of most satisfactory results, and the urgent symptoms disappear. It is a happy circumstance that the lesion most often affects the vertex of the cranium, where it is much more amenable to treatment than it would be if otherwise located. The orbital bones are not often affected with syphilitic ostitis and periostitis. Various symptoms are induced, and the disease can be readily made out at the edge of the orbit. Sometimes a gummatous infiltration of the cellular tissue accompanies this periostitis, which involves the lid and renders the latter immovable. Gummata of the bone and periosteum situated deeper in the orbit may also be felt by the finger passed between the eyeball and the orbital wall; when the infiltration is more extensive, there will be a corresponding displacement of the globe. The farther the gumma is situated towards the back, the more difficult it is to make a positive diagnosis. This can then be gathered only from the symptoms of diminished space, namely, protrusion and rigid immobility of the eyeball. Occasionally the pain is severe, independent of the seat of the affection, and may then imitate a severe neuralgia. In individual cases the ocular muscles, the optic nerve, or even the eye itself may become involved, or, in the case of breaking down, a fatal meningitis may occur, if perforation does not extend externally as is sometimes seen. These cases are very slow in their evolution, and, if recognised soon enough and carefully treated, usually do well. Of somewhat exceptional occurrence are syphilitic lesions of the base of the skull; they sometimes extend from the nasal or the pharyngeal cavity; their course is unfavourable on account of the difficulty of reaching them, although there may be spontaneous expulsion through the nose and pharynx of necrosed pieces of the mass. Lesions of the temporal bones are amongst the rarest manifestations of this disease. As regards the bones of the face, those of the nasal cavity and the upper jaw are most commonly involved. Cases of syphilis of the zygomatic arch are also on record, as are also affections of the lachrymal canal, and of the frontal process of the upper jaw. Long ago syphilitic lesions of the vertebral column were described, those of the cervical portion of the column being commoner than others. The vertebrae may exhibit the ordinary lesions of bone syphilis, but are perhaps especially apt to suffer from circumscribed gummata. Caries and necrosis may develop, followed by spinal deformity, - syphilitic Pott's disease. As in tubercular disease of the spine, the cord and its

envelopes, the spinal nerves, and the surrounding parts may be affected either by pressure of the infiltrate or by involvement in the inflammatory process. Syphilitic ostitis of the spinal foramina may from the swelling induce pain, analgesia, or paralysis, due to pressure upon the spinal nerves. Any of the syphilitic bone lesions described above may be observed in the thorax and extremities, though some of the lesions of the hands and feet have peculiarities of their own calling for special description. The name syphilitic dactylitis has been applied to manifestations of the disease in the phalanges, where the affection commonly enough commences in such soft parts as the fascia, tendons and their sheaths, subsequently involving the bone. When the lesion commences in the bones of the fingers, it involves very early not only the periosteum, but also all the soft parts of the digit. Consequently one or other phalanx, or perhaps several, are enlarged to twice the normal size and over, puffed up, and covered with a shining, smooth, bluish-white skin, which is not movable over the subjacent parts. Although the bone cannot be plainly felt through this puffy mass, its increase in thickness can nevertheless be made out. This enlargement is due to a periostitis or to a central ositis causing a swelling of the cortex of the bone. When strong pressure is applied, it is seen that the bone in the latter case consists of only a much thinned, easily ruptured shell. At other times, again, the skin is pierced by one or more granulating openings the size of a pea, through which the necrotic bone may be felt. In the further course of the disease a portion of the phalanx or the entire bone is destroyed by necrosis, or it is consumed gradually and cast off in the discharge from the granulation wound. The swelling of the finger gradually subsides, and after the cure is perfected a thinning and shortening of the phalanx corresponds to the loss of bone. An elongation of the digit, consequent on a new formation of osseous tissue, is in exceptional instances observed. The enlargement of the fingers is of a drumstick shape, as seen in certain chronic diseases in other organs, the heart and lungs mostly. Destruction of the ligaments occurs when a neighbouring joint is invaded; this results in a loose joint, or, in consequence of adhesions and contractions of new fibrous tissue, ankylosis occurs. There is but little pain in syphilitic dactylitis, and the course of the disease is very slow, the affection generally not making its appearance until some time after the infection, though in congenital cases it may be seen in the first few years. It is more common in the fingers than in the toes. The same form of lesion may develop on the metacarpus and metatarsus. In consequence of the disease attacking the bursa tendons, and joints, an ulcer bordered by a callosity of the skin of the sole of the foot, resembling perforating ulcer of that part, - may be seen; periositis, ostitis, and finally necrosis may be the ultimate outcome of the lesion. The diagnosis of bone syphilis is effected by the clinical application of the distinguishing features above outlined, with due regard to the history of the case.

JOINTS.

During the secondary state of syphilis, arthralgia is frequently early in its occurrence. The affection sometimes appears a few days before the skin eruption or contemporaneously with it, and lasts only for a short time, rarely longer than a week. One may see inflammation of the joints during the first syphilitic eruptions or during their disappearance; and disease of the hip-joint may even be observed in the presence of a recent exanthem, which under specific treatment quickly disappears. In exceptional cases these joint affections develop under the form of a polyarticular rheumatism, during the course of which one or another joint is suddenly affected, as shown by intense pain, and the affection becomes at last localised in one or more joints at the same time or in succession. More generally a more or less plainly marked monarthritis or polyarthritis is present from the beginning. The joints attacked, although freely movable within certain limits, speedily begin to give pain when a full flexion or a full extension is attempted. Examination sometimes reveals a slight redness of the skin and increased head, but usually a slight swelling, or at least a disappearance of normal depressions, for example, at the side of the olecranon or the patella, can be demonstrated. Occasionally a more careful palpation will also reveal one or more painful points on the extremities of the bones entering into the formation of the joint. In individual cases the articular affection is accompanied by high fever, usually with morning remissions, and increased painfulness. After one or two weeks, involution and cure of this synovitis, - for such the process is, - usually occur with a return of the normal function. Exceptionally, however, the synovitis remains chronic and stationary, with only slight pain; or else a chronic synovitis is developed only some years after infection has taken place. These forms are accompanied by less pain and only rarely by fever. The swelling is generally greater, caused by effusion into the joint; but the function is not greatly disturbed; in short, there is a condition of chronic hydrarthrosis. The disease lasts a long time, and improves under proper treatment, with a possible cure at some distant date. Acute affections of only one or more joints with a comparatively favourable issue are occasionally observed in the later stages of syphilis. As a rule, however, the affections of the joints make their appearance after syphilis has existed for some time, and are in that event more intractable, because there will also be present, in addition to such symptoms as swelling and impeded movements, thickening of the capsule, which renders movement possible only with an accompanying grating and friction sound. There is here a villous hyperplasia of the synovial membrane, with or without defects of the cartilage. Pain is not great, but there is little chance of a cure. Movements may be greatly restricted from a callous retraction of the thickened capsule, or ankylosis may be the outcome of the lesion. A gummatous arthritis is present when the swelling is confined to only individual parts of the capsule or ligaments. Effusion into the joint is occasionally

only slight; pain not always is severe, movement is but little impeded. The attack is seldom devere, even when the joint becomes perforated externally from the breaking down of the gummy mass. Syphilis of the articular cartilages is sometimes encountered; generally the affection is accompanied by synovitis, or it follows ostitis. When the latter occurs, gummatous foci in the epiphyses finally also destroys the cartilage in their growth towards the joint. This process is frequently met with in the phalanges; it is, however, frequently encountered in the large bones. This articular affection, which generally runs a chronic course, commonly develops some time after infection, though extension of the inflammation from the periosteum to the neighbouring joint has now and then been observed. Articular affections may therefore occur any time during the course of the constitutional disease; and those which develop early usually run a more favourable course. A very unfavourable result, however, is not to be expected even in the joint inflammations of the later period; although they are characterised by a slow course, their perfect restoration to a normal condition is comparatively seldom observed. The thickenings and villous excrescences of the capsule are not perfectly absorbed on the one hand, and on the other are the cause of crepitation in movement of the joint, besides irregularities, defects and cicatrices in the cartilage. It may happen also that the thickened capsule may become retracted by callosities, ankylosis resulting, or at least movement being greatly restricted, - a result which may also be expected after the healing of gummatous foci in the articular ligaments. Those articular affections which originate in an ostitis or periostitis of a joint generally exhibit obliteration of the latter by partial or complete destruction of the cartilage, the capsule, and the ligaments. The limb below the joint hangs loose and is quite useless. Ankylosis is seldom seen. It is necessary to avoid an incorrect diagnosis and the needless sacrifice of an articulation owing to the comparative rarity of syphilitic articular affections and their resemblance to tuberculous disease. This is particularly true of the knee-joint. Syphilitic synovitis presents no clinical feature in its course by which it can be distinguished from other forms of synovitis. In all doubtful cases the therapeutic test should be employed. In the acute forms of the affection the absence of cardiac lesions and the failure of antirheumatic remedies may suggest the syphilitic origination of the synovial disease. In the absence of a history or other signs or symptoms of syphilis, chronic syphilitic hydrarthrosis cannot be distinguished from tubercular synovitis except by the therapeutic test. Even enormous effusions may take their departure under the exhibition of mercury and iodide of potassium. Gummatous srthritis and synovitis can be diagnosed only by the evidence offered by other lesions of syphilis, such as ulcerating gummata of the skin. Tubercular arthritis differs from the gummatous in the fact that it is often, though not necessarily, associated with

characteristic tuberculous lesions elsewhere, that it is more prone to ulcerate and open externally, and that it gives rise to more rapid and extensive destruction of the bone. The prognosis of syphilitic articular affections is not unfavourable. The synovitis yields readily to specific treatment. Arthritis, even though cartilages and joints are extensively involved and there are contraction and deformity, is also curable in this way, helped in certain cases by sequestrectomy, partial arthrectomy, or other surgical operations. Even when total arthrectomy is required, provided the nature of the disease has been recognised, the prognosis is much better than if the articular lesion had originated from non-specific cause. The prognosis of syphilitic arthritis is favourable when the affection occurs early in the course of syphilis and is recognised and properly treated. Permanent deformity and disability are later produced by atrophic changes of those due to infection by pathogenic germs.

RESPIRATORY SYSTEM.

NOSE.

The nose may show signs of syphilis at any stage. The chancre is sometimes encountered upon the tip and alae of the nose and also in its cavity. It may here appear as a sharply defined, circumscribed, eroded sclerosis, involving the parts mentioned. The glands at the angle of the jaw and neck may be enlarged; and other lesions may elsewhere be observed. In addition to the submaxillary, the preauricular glands may be swollen. A few cases have occurred from the use of infected instruments, but generally a chancre in the nose may be referred to unnatural practices. The sulcus of the alae nasi sometimes is the site of desquamating patches or even of moist and ulcerating papules. In the first stages a catarrh of the nasal mucous membrane may be observed, though only seldom; as in the case of the mouth and pharynx, it is occasioned by a simple erythema or by papules which are localised in these parts. Such a syphilitic catarrh, - rhinitis catarrhalis syphilitica, erythematosa et papulosa, or coryza syphilitica, - does not make itself apparent so much by a tickling sensation and sneezing as by increased secretion and, in the severer forms in which the mucous membrane is infiltrated, especially by a more or less temporary interference with the passage of air through one or both nostrils. The catarrh may even be of the so-called dry form, or the swelling and secretion are inconsiderable. A remarkable feature of this catarrh is that it is apt to last for weeks and months; and the same may be said for the presence of erythematous spots and papules of the mucous membrane seen when the easily accessible parts are involved. The discharge may be entirely purulent or contain a large admixture of pus corpuscles. Stinking masses are produced by the decomposition of the secretion which stagnates in the numerous crevices and recesses of the nasal cavity. This impedes the circulation of air and gives the patient great and continuous annoyance. Not infrequently there is found a single papule in the nasal cavity, and this sometimes grows to a largish size. If a mucous patch ulcerates, it will increase the accumulation of pus and intensify the other symptoms;

moreover, the advancing destruction of syphilitic mucous patches may even occasion denudation of the thin layers of bone or cartilage of the part, and finally to their necrosis and exfoliation. This is, however, rare and no permanent lesions remain, as a rule, to mark the previous existence of this erythematous rhinitis. Gummata of the skin of the nose generally resemble those of the general integument; and the foregoing description of the latter covers well the former. After persisting for some time the gummatous syphilide of the nose generally causes destruction of not only the skin, but also of the cartilage of the nose. The deformity will vary according to the extent of the loss of substance; the ala nasi is generally destroyed, the process beginning at the edge; but ulcerative perforation in the middle of the ala may be seen. Complete destruction of the entire cartilage of the nose is seldom encountered. Usually small portions alone are actually destroyed, while the cicatrised remainder is variously seamed and scarred. It is quite exceptionaly to find atrophy and shrinking of the alae nasi without the occurrence of previous ulceration. Generally speaking, lesions of the nose due to syphilis are rare; but they nevertheless may occur, nasal destruction not being always due to syphilis as was formerly supposed. It is also not true that the cartilage is not affected independently in syphilis; the process of ulcerative character commence in the skin or mucous membrane, denude the cartilage, and thus occasion necrosis. Nevertheless it is a fact that the cartilage of the nose is not very often affected directly in syphilis, but is destroyed much more frequently in a passive manner as the result of gummatous processes of the contiguous skin and mucous membranes. Such destruction involves most frequently the cartilaginous septum; the perforation either exists alone or is combined with extensive defects of the nasal bones. Such a perforation, affecting only the cartilaginous septum, often produces no deformity, and is even unaccompanied by any particular distress to the patient. Its course is sometimes unattended by any symptoms whatever, so that the patient's attention may be first drawn to the defect by the medical attendant's examination. On the other hand, the total destruction of the septum produces a hideous deformity. Both nostrils then coalesce into a single large opening, which is sometimes constricted from above downwards by the dependent top of the nose, and appears to be drawn from side to side. If in addition to this destruction of the mobile septum the tip of the nose is also destroyed, the opening takes a triangular shape. Gummatous processes of the skin imperil the nasal bones sometimes; but even deep ulcers of the skin seldom give rise to denudation or necrosis of these bones. One may come across cases in which a large gummy ulcer in the roof of the nose on one or other side occasions necrosis of the underlying bone; there may be formed a hole as large as a pin in the left or right nasal bone, through which a view of the interior of the nose may be obtained. The treatment is not infrequently very effective in these cases. Plastic operations are sometimes performed for the relief of those cases in which there is a large defect in the roof of the nose, together with loss of

the nasal bones, after the patient has perhaps tried to temporise with the affection by closing the opening with a cork or plug. The conditions are different in the case of gummatous lesions of the interior of the nose. Whether the lesion is situated in the mucous membrane alone or in the periosteum and bones, the process leads with extreme frequency, at any rate more frequently than elsewhere, to destruction, that is, to an ulcer and then to denudation of the bone. This, being deprived of its protective covering, becomes necrotic; it is then loosened from its healthy surroundings by a process of demarcation, and is finally exfoliated. This is the only possible course, though in former times it was held that the frequently very extensive destruction of the osseous framework of the nose was produced only secondarily to ulcerative processes of the mucous membrane. But investigations have shown that the nasal bones are also affected by the active processes taking place in them, and that the periosteum and the bones are very often the primary seat of a gummatous process, and are destroyed without participation of the mucous membrane. It is therefore necessary to consider gummy lesions of mucous membranes and also of the periosteum and bones of the interior of the nose. It was usually held that the nasal cartilage is only laid bare by ulcerative processes of the mucous membrane and of the perichondrium, and is destroyed merely in a passive way; this is refuted by the occurrence of active lesions of these parts. Gummatous rhinitis, the gummy process inside the nose, is seen with tolerable frequency, and , with few exceptions, only after syphilis has been in existence for some considerable time. It also continues much longer than the erythematous and papular syphilitic catarrh, lasting in some cases for months and even years. The serious character of the lesions lies mainly in the more or less extensive destruction of the nasal structures which occur. It may happen that the first appearance of the gummata is characterised by pains, but usually the initial symptoms are very slight. The swelling is observed by the patients only after it produces obstruction to the passage of air. Increased secretion occurs usually at an early period. After the destruction of the gumma occurs, there is an admixture of pus in the discharge, and often the mucous secretion is entirely transformed into a purulent flux. The latter with the progress of the disease constantly increases, inasmuch as the destruction of the bone seldom ceases, but generally spreads farther and farther. A part of the purulent secretion,the water of which evaporates rapidly in the air-current, dries into a crust, which often coats the walls of the nose extensively. Newly formed pus leads sometimes to a thickening of these crusts, and sometimes to their loosening and removal, so that from time to time large quantities of these discoloured crusts are thrown off. This is the reason that the purulent secretion is sometimes very copious and at other times apparently ceases. Another part of the purulent secretion stagnates and is decomposed, whereby stinking gases are produced. These occasion the patient to experience a foul odour or to give off one,

according as they mingle with the inspired or expired air. Necrosis of the nasal bones is seldom absent in cases of gumma of this part; it has been observed as early as the seventh month of the constitutional disease. Whether the gummatous infiltration takes place into the mucous and periosteal lining and produces denudation with consequent necrosis of the bone by ulceration, or whether destruction is produced by a gummatous process originating in the bones themselves, the latter are always very much endangered. In using the probe it is common to encounter denuded lamellae of bone. In rare cases these are again covered, but usually they become loosened and exfoliated. It is not uncokmon in such cases for patients in blowing the nose or clearing the throat to discharge moderately large pieces of bone besides other products of the disease. If only small pieces of the bone are destroyed in this way, the loss does not involve any disagreeable results. If, for instance, parts of the ethmoid bone, a piece, or even the whole, of one of the turbinated bones be expelled, it will occasion the patient no great loss; even the loss of a not too large piece of the septum does not give rise to great disturbance, because after the loss of the vomer, for example, the apex of the roof of the nose is sufficiently protected by the intact perpendicular plate of the ethmoid bone and the cartilaginous septum. It is only in cases of great extension of necrosis that notable deformities are seen, because the nose is then deprived of its osseous structure. The loss of the above-mentioned ethmoidal plate gives rise to sinking of the nasal bones when cicatricial contraction occurs. We then see a saddle-like bending of the bridge of the nose, the tip being tilted upwards and the plane in which the nostrils are situated approaching the perpendicular. This deformity is frequently observed, and indicates unmistakably the process which has occurred within the nose. If to this are added partial destruction of the vomer and of the cartilaginous septum, with subsequent shrinking of the mucous membrane, the appearance produced is as if the exterior surface of the cartilaginous part of the nose were pushed up beneath the osseous part. In the event of a cure without shrinkage occurring, that is, with a smooth cicatrix, and if the nasal bones are intact, there need be no external deformity of the nose, even if there is destruction of all the other nasal bones. The appearance produced when, in addition to the loss of the septum and of the internal nasal bones, the bridge of the nose is also destroyed, is as if the skin of the nose, on account of the lack of all bony support, had fallen into a pyriform aperture. The place of the nose is taken by a few small ridges of skin, which convert the nose into two small round gaps by constant shrinking. In exceptional instances all the bones of the nose are gradually destroyed, and in such cases there are found not only all sorts of deformities, but also interference in various ways with the passage of air, and eventually difficulty in breathing and speaking. Sometimes also the gummatous process attacks also neighbouring parts, as, for example, the nasal process of the superior maxilla, or it spreads to the floor of the nasal cavity, giving rise to necrosis of the horizontal plates of the

palatal process of the upper jaw, and ends in perforation of the hard palate. If large enough, the perforation allows of inspection of the structure of the nose from the mouth, and ready observation of the processes which develop within its cavity. The patient is further distressed by difficulty in mastication, because parts of the food enter the nose from the mouth. In view of the possibility of fatal meningitis, extension of the disease to the lamina cribrosa is of even more consequence. In certain cases the affection extends from the nasal cavity into the adjacent sinuses, for example, into the antrum of Highmore, the sphenoidal sinuses, and the frontal sinuses. The disease seems to extend with special frequency into the frontal sinus; for it is not rarely observed that along with syphilitic ozaena there are excruciating pains in the forehead, which cannot be due to any other cause. The Eustachian tubes, the pharynx, or the larynx may be involved, with the production of special symptoms. But not a few of the nasal troubles are occasioned by extension of the disease from the neighbouring cavities. In addition to the lesions mentioned above, there is sometimes seen a diffuse gummatous infiltration, especially of the mucoperiosteal membrane. In cases of ulceration the cicatrisation is apt to end in extensive adhesions between the neighbouring structures, usually between the septum and the turbinated bones. The usual thing is for the lesion to end in atrophic contraction and callosities. A most unpleasant phenomenon is a very sickly purulent discharge, which becomes dried and changed into dirty crusts with adherent tendencies. The lumen of the nose is obstructed during all the time that infiltration exists; but when shrinking begins, the nasal interior becomes wider and wider, because in addition to atrophy there will be found destruction of the bones with their mucoperiosteal covering. The condition may occupy years in its evolution; to it the terms rhinitis syphilitica atrophica and ozaena have been applied. It is a remarkable fact that in all cases of chronic rhinitis the patient does not feel the foul odour so much as those in his presence. This is due to the destruction of the olfactory portion of the mucous membrane, or to the fact that the patient has become accustomed to the peculiar and repulsive aroma from his diseased nose. Again the anosmia may be due, in cases in which the olfactory function, located in the upper part of the nasal cavity, is preserved, to swelling and infiltration of the mucous membrane covering the middle turbinated bones, which result in occlusion of the olfactory fissure located between the middle turbinated bone and the septum nasi. The patient's sense will improve somewhat when this swelling subsides. It is usually easy enough to diagnose the occurrence of syphilitic lesions of the nose, owing to the distinctive character of the symptoms and the appearances produced on examination. But, should the lesion be situated in one of the many recesses of the nose, the probe will be required for determination. A very rare affection is erythematous and papular inflammation of the nasal mucous membrane; it is easy to recognise owing to the usual concomitance of syphilitic lesions elsewhere. If, however, other

symptoms of syphilis are absent and if a nasal catarrh occurs without previous exposure to cold, a scrofulous origin is suggested; and this is especially the case if the disease lasts a long time and there is an abundant mucopurulent discharge. Careful study of the case will effect a differentiation. Lesions of the cavity of the nose are not infrequently mistaken for other conditions. But other simulating affections, such as scrofula, there are distinctive features which readily suggest the origination of the lesion observed. Sometimes lupus extends from the exterior of the nose into the cavity and causes destruction there. But ordinarily the features of lupus are so distinctive as to render a diagnosis a matter of no difficulty. The characteristic soft, small, reddish-brown subcutaneous papule - the primary efflorescence of the disease - is generally to be found, especially about the periphery of the patch, and when present is diagnostic. At times, however, it bears a resemblance to the syphilitic process. It is chiefly in the serpiginous forms of the late tubercular and ulcerative syphilodermate that the resemblance is to lupus vulgaris. There are several points of difference. Syphilis is much more rapid in its course, marked ulceration following frequently within a few weeks or months of its appearance. With lupus, on the other hand, years may elapse before the same amount of destruction results. In lupus there are usually several points of ulceration; in syphilis, one or several which incline to coalesce. The ulcers of lupus are apt to be superficial, whereas those of syphilis are usually deep, with a punched-out appearance. Lupus papules are small, soft and but slightly elevated, and frequently appear again in the scars left by the disease; the papules or tubercles of syphilis are larger, more elevated, firm and harder, and are seldom seen in the scar or track of the disease. The secretion of the syphilitic ulcer is abundant, purulent and offensive, and the crusts thick, often oystershell-like, and of a greenish or blackish colour; the secretion of lupus ulceration is slight, odourless, the crusts thin and scanty and of a reddish or reddish-brown colour. The scar of lupus is generally hard, shrunken, yellowish, and more or less distorted, while that of syphilis is soft, and, compared to the amount of ulceration, not nearly so disfiguring. The bone structures are not involved in lupus; they may be in syphilis. The two diseases have different histories; lupus generally begins in childhood and runs a slow and chronic course; syphilis is usually seen after adolescence or adult age, and progresses more slowly. In syphilis, moreover, other evidences of the disease may be discovered.

LARYNX.

Syphilitics not infrequently present laryngeal troubles, the commonest of which is perhaps an erythema occasioning catarrhal symptoms in the secondary stage of the disease. This erythematous catarrhal laryngitis is usually manifested by a redness and infiltration unaccompanied by much secretion, though in less frequent instances there may be increased secretion with erosions or serious infiltration extending to the muscles, and so severe as to occasion a condition of paresis. Between

these two extremes of erythema of the larynx there are all sorts of varieties. When the secretion is diminished the passing air produces more rapid evaporation of the fluids and drying of the secretion into crusts, which adhere to the vocal cords or agglutinate them for short distances. Usually the erythema extends over the whole laryngeal mucous membrane, but the affection may be limited to such components as the epiglottis, aryepiglottic folds, and false vocal cords; these parts may be affected simultaneously. The extent and severity of the erythema will govern the amount of hoarseness produced, which sometimes is so great as to amount to a veritable aphonia. The amount of secretion will govern the desire to cough and the sensation of dryness of the laryngeal region which the patient experiences. This laryngitis syphilitica erythematosa catarrhalis is not infrequently one of the first symptoms of the constitutional disease, and is accompanied by similaraffections of the palate and pharynx; by mucous patches in the mouth, and by the early syphilides. Sometimes it develops before the other symptoms, sometimes it lasts much longer than the others. Patients exposed to atmospheric inclemencies suffer from the lesion for a considerable period, which is in them particularly apt to recur. Only in a small proportion of syphilitics do we find a papular eruption in the larynx. This laryngitis syphilitica papulosa is characterised by the appearance of papules in the form of infiltrations the size of a lentil or larger, elongated rather than round, or even cylindrical when situated on the vocal cords. They project very little above the general surface. They not infrequently appear as if coated with a grayish-white epithelial scurf, or, after this falls off, the surface shows a red punctate appearance, or it may even be ulcerated. Their most frequent site is the free border of the epiglottis, whence they usually extend towards the posterior surface; also the aryepiglottic folds and the mucous membrane over the arytenoid cartilage. They are seen more rarely on the true vocal cords; an erythematous eruption sometimes surrounds the papules. The latter occasion painful fissues when located in the interarytenoid region. When the primary infection occurs in the neighbourhood, on the lips for example, there may be severe swelling of the true and false vocal cords. In certain cases a proliferating mucous patch on one or other of the true vocal cords may give rise to such severe dyspnoea that the operation of tracheotomy will be required. The papular lesions generally coincides with the early syphilodermata, and is associated with them. It undergoes resolution much more rapidly than erythema, the usual outcome of the disease being healing after breaking down of the mucous patch. In the tertiary stage of syphilis laryngeal gummata may be observed. These develop either in the form of numerous small nodules or as diffuse infiltrations. The epiglottis, the aryepiglottic folds, the posterior surface of the arytenoid region, and the true and false vocal cords are the favourite sites of the lesion. These tumours cause, according to their location, various deformities of the epiglottis, shapeless thickening of the aryepiglottic

fold, the false vocal vords, and the arytenoid cartilage, or protuberances of the true vocal cords. When the infiltration is of a uniform character, the true vocal cords may have a gelatinous appearance. Phonetic impairments are observed, and also stenosis of the glottis in the eventof there being considerable infiltration of both vocal cords. At the commencement of the trouble the gummata are convered by a dark-red mucous membrane, which pales gradually as the absorption of the infiltrate progresses. On the whole, however, they are absorbed more slowly than in other places, especially the larger gummy nodes, which are, however, seldom encountered in these parts. The gummata often break down and ulcers then form, the edges of which are infiltrated, sharply cut, sometimes as if punched out. The floor of the ulcer is coated or red and granulating, according as necrotic particles are still adherent or not. Occasionally papillomatous proliferations are found on the floor and border of the ulcers. They probably have nothing to do with syphilis as such, and persist even after the cicatrisation of the ulcer. Very little is known regarding gummatous lesions of the laryngeal muscles. In other parts the destruction occasioned by gummata is not infrequently very great. On the epiglottis they soon give rise to denudation of the cartilage, which seldom acquires another covering, and usually becomes necrotic. In this way the epiglottis may ulcerate in great part or entirely, or other cartilage may become destroyed by the gummatous changes. Inflammation of the perichondrium will produce separation of the cartilages, which generally become necrotic, partially or entirely. Gummy processes which affect the perichomdrium and cartilages from the beginning are seldom seen. In either case an abscess forms around the necrotic cartilage, or an ulcerated cavity which exposes to the danger of suffocation as a result of its extension, or of the development of oedema. Favourable cases result in loosening of the sequestra, which usually are coughed up by the patient. In the event of gummata of the true vocal cords proceeding to ulceration, they appear here and there as if eroded on their free border from their insertion into the processus vocalis. If the ulcer is situated in the angle between epiglottis and pharyngoepiglottic arch, on the posterior border of the larynx, or on some other part which is concerned in deglutition, or is moved during speaking or respiration, the pains are often severe, especially during these normal acts. Disorders occur also when, in case of defect of the epiglottis or as the result of imperfect action of the laryngeal muscles, fluids or particles of food enter the larynx, or speech is impaired by ulcers of the vocal cords. In rare instances syphilitic lesions of the larynx give rise to severe spasm of the lottis, to which the patients succumb, if not tracheotomatised; or oedema of the glottis complicates syphilitic laryngitis and necessitates the same course. Fatal haemorrhage may also terminate laryngeal syphilitic ulceration. Sometimes the ulceration may last for years and cause the patient little or no annoyance. Various troubles are occasioned according to the situation and amount of tissue loss occasioned by scar-formation.

Small ulcers in comparatively unimportant places may heal perfectly and leave behind them no trace of their existence. The vocal cords are, of course, very sensitive in this regard, because very small cicatrices interfere with speech. But even after cicatrisation of larger losses of the epiglottis, a deficient closure of the larynx during eating and drinking does not permanently remain. Indeed, complete loss of the epiglottis does not have this effect, and for the reason that the patient learns to contract the muscles of his larynx so as to close the aperture when he is swallowing food or drink. During the process of cicatrisation there may be seen bands of adhesions extending from one side of the larynx to the other. This cicatrisation may be very serious if it occurs in ulcers of both vocal cords at the same time, thus inducing synechia. The adhesion generally begins at the anterior angle and seems to progress quite rapidly. The posterior angle remains usually open in the form of a larger or smaller, round or sickle-shaped gap. The interior of the larynx in rare instances is obstructed by diaphragm-like adhesions below the vocal cords. Sometimes cases occur of adhesions of the epiglottis to the arytenoepiglottic ligaments and to the arythenoid cartilage. It is obvious that the difficulty in breathing must increase with the increasing narrowness of the opening left over after cicatrisation, and that in some cases this dyspnoea may increase to such an extent that tracheotomy must be performed to avert death by suffocation; the same procedure will be required in cases of oedema with laryngeal stenosis. It is not easy to say definitely what size the aperture remaining must be for the due performance of respiration. Sometimes apparently large openings cause serious suffocative attacks, while in other cases much smaller openings may give rise to little inconvenience. Probably the rapidity of development of the stenosis is the important factor, the patient becoming accustomed to the laryngeal narrowing if given sufficient time. Difficulty in phonation is obviously present in these cases. Adhesion may be formed to adjoining parts, with special phenomena according to the condition obtaining. The diagnosis of syphilitic laryngeal diseases must be based on the laryngeal inflammation associated with nodules and ulcers, and the general syphilitic history usually obtainable. It is important to bear in mind, in distinguishing these affections from tuberculosis, that the mucous membrane surrounding syphilitic ulcers is practically normal in colour or congested, not pale. A positive diagnosis can usually be effected in view of the additional facts that the gummatous ulceration is much more rapid, and that the disease responds promptly to the usual specific medication. Syphilitic ulcers are of rapid development, sometimes this occupying but a few days; they are surrounded by reddened oedematous mucous membrane, are generally single, and mainly located on the upper surface of the epiglottis. The evolution of tubercular affections of the larynx occupies months. The differential diagnosis

between gummatous and cancerous infiltration is dependent on somewhat the same difference in symptoms, though occasionally histological examination of an excised piece will be necessary before the real nature of the case can be decided upon.

TRACHEA AND BRONCHI.

The trachea and bronchi may be affected in the secondary stage of syphilis; mucous patches occur, which may be located on the posterior walls of these tubes and give rise to obstinate bronchitis resisting all medicaments except mercury. In late syphilis gummatous ulceration of the trache and bronchi may occur, and be extensive and superficial or localised and deep. The lesion is usually situated about the tracheal bifurcation, & may cause necrosis of one or more rings, these in certain instances being coughed up. As a result of this gummatous ulceration the surrounding organs are involved, and it has been known for perforation of the oesophagus, the aorta, and the posterior mediastinum to occur.

Contractions after healing may very seriously interfere with respiration. When the trachea is affected there may be an obstinate cough, with expectoration of blood-stained sputa, and some pain and tenderness behind the sternum. Large tracheal rales may be heard on auscultation. When the bronchi are invaded the prognosis is less favourable then when tracheal affection alone exists.

LUNGS.

Syphilitic pulmonary affections include catarrhal inflammation of the bronchial mucous membranes, chronic inflammatory new formations, which affect especially the connective tissue, producing sclerosis or gummatous growths. About the beginning of the century before last, the subject of pulmonary syphilis first began to receive the attention it deserved. Lung syphilis is of rare occurrence as compared with the forms of specific laryngitis, but even here Leman affirmed that there is an early simple catarrh of the larynx indistinguishable from the specific catarrhs. Whistler, in recording his observations in sone eight-eight cases of the lesions found in syphilis of the larynx, observes that catarrhal congestions in early laryngeal syphilis simulate the same lesions from other causes. Schnitzler lays particular stress on the association of pulmonary syphilis with affections of the larynx and a specific bronchitis which may occur in the first two months after infection. Many other writers on this subject affirm that laryngeal and bronchial catarrh attend the period of early skin eruptions, disappearing on the initiation of specific treatment. The rarity of pulmonary syphilis has also been attested by such writers as Greenfield, who states that out of twenty-two cases of visceral syphilis, only one occurred in the lung and four in the larynx and trachea; in these cases, while the dura mater and cerebral vessels were extensively diseased, no trace of skin affection could be found. Goodhart has collected, from the post-mortem records in Guy's Hospital during twenty-two years, one hundred and eighty-nine cases of visceral syphilis, but in only thirty-eight of these chronic lung disease occurred. Phthisis associated with syphilis is usually a late secondary or tertiary

process, which appears from two to five years after the infection; in rare cases ten, even twenty, years after inoculation. Cases of phthisis associated with syphilis have, however, been described as occurring within the first twelve months after infection. Further investigation may establish these cases of early pulmonary syphilis as attributable to violent systemic infection, or their etiology may be involved in the deterioration of the general health which sometimes occurs. Moreover, one must bear in mind that simple phthisis may more readily be developed in the scrofulous syphilitic, owing to the predisposition of such persons to catarrhal forms of inflammation. In the course of syphilis there is also a tendency to catarrhal processes through anaemia and damaged general health, which may predispose certain cases to an ordinary type of phthisis. The origin of the new formation in both tubercular and syphilitic phthisis is similar, namely, the arterial, lymphatic, and the peribronchial sheaths, spreading thence to the interlobular connective tissues. It is therefore not surprising that it has been difficult to differentiate the tubercular from the specific forms of phthisis; and in the opinion of Goodhart there is no histological difference between syphilitic and tubercular phthisis, except that there is more vascularity observed in the former case. It may be assumed that true pulmonary tuberculosis may be associated with syphilis, but preserves its own pathological characters, that, although we do not exactly understand the exact differential histological changes, there is sufficient evidence to show that there is a distinct association between syphilis and pulmonary disease; and that syphilitic phthisis is commonly interstitial. Whether the relation be one of cause and effect, or whether the process is simply one of a modification of ordinary tubercular phthisis, opinions are at variance. The final adjustment of the theories concerning the specific etiology of tubercular phthisis will throw further light on the etiology of syphilitic phthisis. That gummata may be found in the lungs is a well-established fact, and by some authorities is not considered rare. In certain cases of syphilis the antecedent of pulmonary changes is a laryngeal or bronchial catarrh. The relation of the active virus in the blood to the process is still the subject of debate. Hutchinson (loc. cit.) says, "If the infected blood were the cause of the local phenomena, it is almost certain that such phenomena will be symmetrical, because the blood is equally supplied to both sides; such is the case during the secondary stage. If, however, the symptoms result from tissue-conditions, and the blood is at the time of the outbreak free, then there is a considerable probability that local influences may take a large share in evoking them, and they will be asymmetrical - evoked by some local cause." The existence, then, of gummata does not necessarily indicate that there is any active virus in the blood, because their formation is sometimes symmetrical, sometimes asymmetrical. The lesions of pulmonary syphilis may be divided into four classes: First, early phthisis, associated with principal interlobular proliferation; second, advanced syphilis, in

which gummatous or allied formation exists; third, simple phthisis, developing in consequence of impaired general health induced by syphilis; and, fourth, inherited or congenital syphilis occurring in children. The pathological processes in the majority of cases in the adult consist of interstitial new formation, very often evoked by antecedent catarrhal inflammation. At first small spindle-shaped and round cells appear and develop into connective tissue, among the fibres of which blood-vessels are freely produced; the septa of the alveoli are thickened and the alveoli themselves compressed. In any morbid process in the lungs, such as tubercle, sarcoma, or cancer, the alveoli act as the inter-fascicular spaces of the connective tissue. In the same manner in syphilis the alveoli of the lungs are always in the later stages, and sometimes primarily, more or less filled with small cells, which, surrounded by the newly-formed connective-tissue fibrous framework, gives the appearance of some of the forms of simple phthisis. The smaller bronchi become narrowed, and perhaps occluded, by the pressure of the new growth which develops along their lumen. Occlusion of the bronchi may also be caused by enlargement of the bronchial glands, which is one of the incidents of the specific lesion. There is much that is puzzling about the early syphilitic pulmonary lesions. The vascularity and advanced grade of organisation of the new growth are considered by Greenfield and Goodhart to be characteristic when compared with tubercular phthisis, in which the original growth is bloodless, and the tendency is to retrograde metamorphosis. Green and Virchow suggest that the origin of syphilitic diseases of the lungs is distinctive in this respect, that while in the ordinary forms of phthisis the fibroid is secondary and coequal in its development with changes in the alveoli and alveolar wall, in syphilis there are primarily interstitial changes. In chronic bronchitis the fibroid thickening proceeds from the bronchi. Wagner, however, maintains that implication of the alveolar wall is as common in syphilis as in phthisis pulmonalis. The change in the intima of the blood-vessels is characteristic of the syphilitic processes as generally occurring; this has not yet been demonstrated in the lung, but merely the general thickening of the external coat of the vessels. When entire vascular consolidation and breaking down occurs, the process is similar to ordinary phthisis, and cannot be distinguished from it. In the gummatous stage the same formation of cellular and connective tissue is found as in the diffused form, with which gummata are often associated. Gummata may originate anywhere in the intervesicular tissue, usually near the visceral pleura. Sometimes they are found near the root of the lungs, intimately connected with the blood-vessels and bronchial sheaths. They may also be formed in the deeper layers of the costal pleura or upon the periosteum of the ribs. Owing to the peculiar anatomical formation of gummata, their subsequent history is one of combined caseous and fatty degeneration. These centres of softening may communicate with a bronchus, more or less rapid evacuation

of the mass may occur, and a cavity be formed which often enlarges as the gummata break down. Contraction may ensue, leaving a small fibrous scar with cheesy cretaceous deposit, or the gummata may point externally, with or without the appearance of inflammation in the neighbouring tissues, or they may remain stationary for an indefinite period. In some cases the pulmonary new formation may be combined interstitial, gummatous, and catarrhal process; but, as a rule, the fibroid process of syphilis in the earlier stages is not accompanied by the filling of the alveoli with catarrhal cells. Gummata developed in or near the pleural sac may increase in size, and simulate pleural effusions by compressing the lung. The naked-eye appearance of the lung in the earlier stages of pulmonary syphilis is firmer at the seat of deposit than elsewhere. It is also heavier and has a smoother surface. The infiltrated parts are grayish-red or grayish-yellow, smooth, and homogeneous. Sometimes the appearance resembles pale-whitish patches invading districts of the lung. The hyperplastic material becomes converted into a though, contracting, fibrous tissue, which radiates through the lung, drawing together the bronchial tubes and flatteneing them, possibly even to obliteration. The entire lung may be involved, but the changes most frequently proceed from the hilus of the organ into the interior, following the track of the bronchial radicles and the bronchial and pulmonary arteries. The lesions frequently develop near the visceral pleura, where there is more connective tissue. This accounts for the depressed puckered cicatrices which are found in the surface of the pleural membrane. According to Goodhart, the macroscopic appearances in syphilitic pulmonary disease differ "both from a chronic pneumonia and from that solidification ensuing after contraction of the lung from old pleurisy, in that it is less evenly distributed, and generally less widely spread over the lobe, than they. It is nodular, rather diffused, and more symmetrical than unilateral. From miners' phthisis the appearance differs in the absence of the extreme dilatation of the bronchial tubes and more solidity from greater growth. The tissues involved are more tough and less granular than red or gray hepatisation." It is possible to differentiate other forms of fibroid phthisis by noting, in addition to the above points, the presence of the syphilitic process in other viscera, and by comparing the clinical records with the autopsical findings. Specific lesions may be found in any part of one or both lungs, but their localisation at definite points in the lungs, leaving the balance free even when the lesion has proceeded to the formation of cavities, may be characteristic. There is, however, a wide division for professional opinion upon the subject of the localisation of the process in syphilitic pulmonary disease; some claiming the middle lobe, some a symmetrical lesion at the apices, others lesions at a definite point elsewhere than at the apices. If the pulmonary lesions are introduced by an attack of pleurisy, the process in the lungs is usually located at one or both bases. Some, however, locate the disease at the base, without an antecedent pleural inflammation.

Gummata are more frequently situated in the middle or lower lobes of one or both lungs, and are defined by a boundary layer of fibrous tissue. Fibroid development may ensure their adhesion to the visceral and costal pleura. They are gray or yellowish-gray, hard, well-defined nodules, of varying size and number, occurring as single large masses surrounded by normal or compressed lung. In the centre is found a diffluent material, not unlike the centre of a scirrhous nodule, similarly enclosed in a limit in fibrous investment from an inch to many inches thick. In the condition of the neighbouring pulmonary surface a difference may be observed between gummatous and tuberculous nodules; the latter occur in more numerous masses, usually small, and the entire lung is more or less diseased; while in syphilis extended districts of non-affected lung occur in the neighbourhood of gummata. Whenever gummatous lesions of the lungs exist a history of pustular eruptions, laryngitis, arterial lesions - in short, some indication of general systemic syphilitic poisoning - can always be found. Fournier thinks there are five anatomical points of distinction between syphilitic gummata and tubercle: First, tubercle involves the upper part of both lungs, gummata one lung, and may be limited to a portion; second, gummata are few, as a rule, and solitary, tubercles sooner or later become confluent; third, gummata are larger than tubercles, never miliary in form; fourth, gummata are always yellow or white, never transparent like miliary tubercle; fifth, until softening takes place gummata are of more equal consistency than tubercles, and if they soften do not break down, wholly owing to the capsule; histologically, there is no difference in structure. Gummatous formations may be found on the pericardium and heart, and in the thoracic and abdominal walls. Clinically, the most important pathological feature is that large areas of healthy lung are interposed between the affected areas; this is not so in ordinary phthisis pulmonalis. Syphilitics are, like the scrofulous, rather prone to bronchial catarrhal lesions; the affection may spread down the bronchial tubes, giving rise to a general bronchitis; a coexistent laryngitis may or may not exist. Enlargement of the bronchial glands is frequently combined with the syphilitic pulmonary process. When the glands are enlarged they present a firm pigmented character, varying in size from a hazelnut to an egg, and the connective tissue surrounding them is usually infiltrated. Subsequently, owing to the pressure of the mediastinal growths, the bronchi are narrowed and more or less occluded; the same effects are occasioned in the smaller bronchial tubes by the pressure of the new growth which develops along their lumen. The effects of bronchial narrowing or occlusion produce serious mischief in the lungs proportioned to the degree of obstruction. By the retention of the bronchial secretions the supply of air to the vesicles is interfered with; emphysema, with or without asthmatic symptoms or atelectasis, may ensue. Further, the results of bronchial narrowing affect the circulation through the lungs, and in combination with atelectasis very intractable local bronchitis may be developed; and, with or without atheroma, haemorrhagic infarctions may occur,

with a form of pneumonia which has been described by Fuchs as apneumatosis. The narrowing of the bronchial tubes in specific fibroid phthisis affords a means of differentiating this disease from non-syphilitic fibroid phthisis, in which the tubes are widened. Cases have been reported of nodules of syphilitic new formations in the mucous membrane of the superior and inferior extremities of the trachea and larger bronchi. The nodules ulcerate, and in healing cicatricial bands of fibrous tissue are found which cause contraction of the tracheal tube transversely or diminish its length. These lesions resemble tuberculous ulceration, but they differ in the nature of the initial neoplasm by the formation of cicatricial tissue and by the tendency to stenosis of the tracheal tube. The cutaneous syphilides, mucous patches, the exostoses of the bones of the cranium help to demonstrate the connection of the marked cachexia with syphilis rather than the simulating disease. In view of the fact that the pathology of syphilitic pulmonary disease is largely that of not a few forms of lung disease, so the symptoms must be common to those obtaining in other forms of pulmonary affection. They are insidious and gradual in their development, and may be classed as subjective, physical, and objective phenomena. The subjective symptoms may be present without noticeable departure from an appearance of health. There may be difficult respiration with more or less dyspnoea, especially in the mornings and evenings, besides a sense of heaviness and oppression in the chest, with a feeling of inability to inflate the lungs. These symptoms may be increased on exertion, respiration becoming wheezy, with inperfectly developed asthmatic attacks. Hoarseness, with varying degrees of aphonia, more or less dysphagia or unequal pupils, may be present. Nearly all these symptoms may be accounted for as indicative of mediastinal pressure or irritation of the pneumogastric nerve by the enlargement of the bronchial glands. The train of phenomena may be present in whole or in part, and the intensity of their manifestations may vary from time to time in the history of a single case. If the bronchial glands are much enlarged, a sense of discomfort, oppression, and uneasiness at the root of the neck may be experienced, which increases until actual pain is felt, located in the back between the scapulae, but sometimes radiating through the intercostal nerves around the chest. Cough, as a rule, is an early symptom, usually dry, paroxysmal, and associated with dyspnoea, or there may be bronchial catarrh, with a relative amount of expectoration. Syphilitic disease of the larynx may occur coequal with the pulmonary trouble, and some of the above symptoms may be thus explained and many others added. Rheumatic and nervous symptoms, including sleeplessness and anaemia, may testify to the syphilitic infection of the system. On physical examination of the chest, thickening of the head of the periosteum of one or both clavicles, substernal tenderness, thickening of the tibial periosteum, are usually detected. Prominent among the physical signs are the evidences of enlargement of the bronchial glands. According to Mussey, percussion over the spinous processes of the

cervical vertebrae in the course of the trachea reveals in a healthy subject a distinct tubular sound down to the point of bifurcation of the trachea at the level of the fourth dorsal vertebra. Opposite the fifth and downwards we get the low-pitched pulmonary resonance. When the tracheal and bronchial glands are enlarged, the tubular sound over the upper dorsal vertebra is replaced by dulness, which may contrast sharply above with the tracheal and below with the vesicular resonance. The respiratory murmur will be feeble in volume and limited to inspiration, especially over the interscapular region. Over one or the other bronchus the respiratory murmur may be more high pitched than in health, and slightly exaggerated on one side of the base of the chest. The rhythm is often jerky and paroxysmal; the paroxysms are more or less constant, but are liable at times to increase. The additional physical signs in syphilitic phthisis, unassociated with gummata, are those shared with other forms of fibroid phthisis, and do not call for full description here, as increasing dulness, varying degrees of bronchial breathing, and bronchophony. A peculiar alveolar rustle, resembling the sound produced by the rumpling of wall-paper, is said to be characteristic. Inspection or palpation sometimes reveals changes in the contour of the chest, with displacement of the movable thoracic viscera, as in fibroid phthisis. When cavities occur, the physical signs necessarily correspond to those of the other varieties of phthisis at this stage. When a gumma is large enough to be recognised by physical examination, there is found to be dulness or flatness on percussion, confined to a section of the chest, and not occupying its semi-circumference, as in pleural effusions. The vocal fremitus is suppressed in proportion to the size of the gumma. The respiratory murmur is abruptly cut off over the area of flatness, but it may be only distant bronchial breathing. The vocal resonance is absent or is distant bronchophony. Around the gumma the respiratory murmur is usually very feeble or scarcely audible, generally without rales unless they are due to neighbouring congestion. The percussion resonance is good or exaggerated. Proportionate vicarious functional activity prevails in the opposite lung. If the gumma be large, the heart's impulse may be displaced to the left or right, and dyspnoea may come on as in a case of pleural effusion. In this stage, owing to irritation of the bronchial mucous membrane, there may be expectoration of a tough, glairy mucus, or as a gumma softens the expectoration may become purulent. The objective phenomena vary: the chest is often well developed, the body fairly nourished, and constitutional symptoms of a severe character may be wanting. The patient may be capable of hard physical labour even though a considerable part of the lung be affected. Thus, Moxon describes the case of a man "employed in carrying sacks of grain who was suddenly killed, and who had fibroid infiltration of a great part of the left lung and part of the right, and besides scars in his liver and testes." But in some cases the complexion is pallid and waxy, indicative of a cachexia associated with digestive disorders, with night-sweats,

and a variable but low temperature. Usually the progress of the disease is slower in syphilitic than in tubercular phthisis, but when the systemic poisoning is grave and many other organs are coincidently involved, the progress is more rapid; but the process peculiar to syphilis is often past, and the patient suffers from simple catarrhal phthisis and night-sweats are said to be less frequent than in ordinary phthisis, and the pulse is slower. Haemoptysis occurs infrequently, because the process in the lungs is chiefly fibroid; but it is possible through the rupture of newly-developed blood-vessels in the new formation in the lung or haemorrhagic infarction through the rupture of atheromatous vessels. The recognition of the origination of the disease will depend upon the history of the case, the prior or coexisting syphilitic lesions, especially paryngeal processes, cutaneous syphilides, exostoses, perforation of the palate, substernal tenderness, and the thickening of the tibial periosteum or that of the head or one or both clavicles. Family immunity from phthisical tendency, recovery from lesions usually incurable if they have any other than a specific origin, are suggestive of pulmonary syphilis. If a patient retains flesh and strength beyond the natural expectoration considering the serious lesions of the lungs, the fact is of relative importance when considered in connection in the other diagnostic features. The distribution of specific lesions is variously located by different authors. Grandidice found induration affecting the middle lobe of the right lung in twenty-seven of the thirty cases believed to be specific phthisis; the surrounding lung contained large areas free from the disease. This tendency to localisation in portions of the lungs, leaving large portions free from disease, is of diagnostic value. The prognosis has to do with the discovery of syphilis as the cause of the disease and on the subsequent appropriate treatment. Grave and important specific lesions yield sometimes to suitable treatment. Fournier mentions a case in which "dulness at the summit of the left lung was extensive and signs of a cavity distinct. After six weeks of antisyphilitic treatment recovery was almost complete. In this case the presence of a phagedenic ulcer upon the foot was the only sign that suggested syphilis, the symptoms of the pulmonary affection being identical with those of tubercular phthisis. The principles presiding over the prognosis of the various stages of pulmonary diseases in general are applicable to syphilitic lung disease.

ORGANS OF SPECIAL SENSE.

EYE.

In considering the syphilitic ocular affections it must be admitted that all the tissues of the eyeball and eyelids may at times manifest the signs of this dread and searching dyscrasia, although it is rarely so marked in its character as to be distinguished with certainty from the other forms of eye disease by its appearance alone. Chancre of the eyebrows is rare, and when present presents the characteristics of the lesion as elsewhere occurring; the same remark applies

to the syphilodermata here sometimes observed. A chancre may also develop on the eyelid; and it there runs the usual course, though perhaps not being recognised as a primary syphilitic lesion owing to its unusual situation. The affection gradually develops into a characteristic saucer-shaped ulceration, with an indurated base and rounded edges. The eyelids may also show secondary syphilides, gummata, and the so-called tertiary ulcers. Syphilitic tarsitis is an inflammatory affection of the tarsus, which gives rise to great thickening of the lids, and in some instances is due to a diffuse gummatous infiltration. More rarely is it acute, and then must not be mistaken for ordinary strumous inflammation of the ciliary border, from which it is differentiated by the thickening and induration of the tarsus. Syphilitic periostitis may attack the orbital margins either in a gummatous or sclerosing form. When the orbital walls are involved behind the capsule of Tenon, the type is almost always gummatous. The symptoms are then pain, worse at night, restriction in the mobility of the globe, strabismus, and diplopia. Optic neuritis and keratitis may be observed complicating the condition. Gummata involving the superior orbital tissue may work their way towards the median fossa of the skull. Caries of the margin of the orbit is sometimes an outcome of a former syphilitic attack. Gummatous infiltration of the caruncle may be observed; and it is necessary to beware of mistaking this affection for a cancerous ulcer which it closely simulates, and from which it can be distinguished by the therapeutic test and the history of the case. Syphilis sometimes leads to enlargement and induration of the lachrymal gland; this hypertrophied body appears as an indurated lobulated tumour located in the upper and outer part of the orbit, and capable of prompt response to specific medication. There occasionally occurs a lachrymal abcess, especially in children, above the internal palpebral ligament and external to the sac itself; hence the name prelachrymal abscess given to it. The lachrymal sac and nasal duct may become obstructed through periostitis and caries of the lachrymal bone or the pressure of gummatous deposits. On the whole the lachrymal apparatus possesses a remarkable comparative freedom from syphilitic manifestations. The fact that the affection does not, however, spare the external ocular muscles is evident from the frequency with which paralyses of these are observed; about 50 per cent. of the cases are of specific origin. The usual affection is an inflammation or gummatous change affecting the nerve at the base of the brain, or in the orbit, or there may be diseases of the nuclei of the nerve or of the brain in the immediate vicinity, or, finally, the lesions may exist in the third ventricle, in the aqueduct of Sylvius, or in the fourth ventricle. Syphilitic paralysis is usually, but not always, one of the late manifestations of syphilis. The oculomotor nerve is the one most commonly involved. In exceptional cases there may be a paralysis of the ocular muscles of hereditary syphilitic origin. The usual symptoms of the palsy of the ocular muscles are present, namely, double

vision, squint, limitation of movement in the direction of the affected muscles, vertigo, and an altered position of the carriage of the head, which is apt to be turned in the direction in which double images are least troublesome to the patient. Both the hereditary and the constitutional affection may give rise to opthalmoplegia, which is characterised by loss of power in one or more of the ocular muscles, which gradually increases and involves other muscles until all of them may be paralysed. Besides the paralyses of the external ocular muscles, there are various conditions which arise under the influence of syphilis located in the pupil and the ciliary body; thus, if the oculomotor is paralysed and those branches which supply the iris and the ciliary body are affected, there will be dilatation of the pupil and loss of accomodation. Occasionally there is a wide dilatation of one pupil without affection of the ciliary body, and inequality of the pupils may arise in the course of a focal syphilitic cerebral lesions. The therapeutic test gives a satisfactory response. A chancre may be encountered on the conjunctiva due to infection perhaps by a syphilitic tongue. Conjunctivitis and photophobia frequently accompany the affection, which usually heals without any permanent injury, at the most a scar being left; the preauricular and the submaxillary lymphatic glands are enlarged in this condition. Syphilis not infrequently finds expression in a stubborn conjunctical catarrh, and even in hereditary syphilis a reddening of the membrane may be seen. Distinctly raised or only slightly elevated papules may be found on the conjunctiva, accompanied by the usual signs of the constitutional disease elsewhere. Conjunctival gummata usually invade the sclera or the limbus corneae according to situation; should they ulcerate, a cicatrix or pterygium-like thickening of the membrane may be seen, and this must not be mistaken for a malignant neoplasm. A number of cases are on record of syphilitic scleritis and episcleritis, that is, inflammation of the sclera itself or its overlying tissue; and in the later stages of syphilis a true gummatous scleritis may occur, characterised by the development of this membrane of yellowish-brown and semi-translucent nodules. Lesions of the cornea are of somewhat common occurrence in syphilis, especially interstitial keratitis, also known as parenchymatous or diffuse keratitis. In it there is a chronic inflammation of the entire thickness of the membrane, the latter gradually passing into a condition of universal thick haziness, associated with vascularisation, but seldom or never with an ulcerative condition. It is seldom seen in its typical form in acquired syphilis, but is a very common complication of the hereditary disease. Punctate keratitis is another form of corneal affection, and is characterised by the deposition of opaque dots arranged in a triangular manner upon the posterior elastic lamina of the cornea; it is usually an indication of affections of the iris, choroid, and vitreous, but may also appear both with and without iritis, and as a syphilitic inflammation. It occurs in the late or gummatous period of syphilis, but is also

seen in children before puberty as one of the forms of inherited syphilis. Syphilitic lesions of the iris are of great importance: apart from their general interest, on account of the fact that over 50 per cent. of all inflammatory affections of the iris are syphilitic, and also because iritis is a very common affection, which is encountered in all stages of syphilis, occasionally even as the first symptom of the constitutional infection. Plastic iritis of syphilitic origin may develop in the early stages of general syphilis, usually between the second and the ninth month after the chancre, and is characterised by all the ordinary symptoms of iritis, such as pericorneal injection, contracted, sluggish, or immobile pupil, discoloured itis, abnormal reaction to a mydriatic, slight tenderness on pressure, the formation of attachments between the margin of the iris and the capsule of the lens, - posterior synechiae, - and nocturnally-increased severe frontal or general headache. The clinical phenomena of the affection do not differ in most cases from the idiopathic form, some authors holding, moreover, that the symptomatology of both are exactly alike. In a certain number of cases syphilitic iritis occurs with the formation of yellowish-red nodules, papules, of the size of a pinhead, which, Fuchs says, have their seat on the edge of the cilia or the pupil, but never between these two zones, - iritis papulosa; later on gummata appear on the iris. Syphilitic parenchymatous iritis, or true syphilitic iritis, belongs to the parenchymatous variety of the affection, being an accompaniment of secondary syphilis, and is characterised by a deposit of yellowish-red nodules on the ciliary or the papillary border of the inflamed iris, comparable to the papules and condylomata of the stage at which it occurs, and hence called iritis papulosa or condylomatous iritis. These small nodules vary in number from one to four, and are generally absorbed under treatment, leaving faint scars in the tissue of the iris to mark their former situation. Sometimes instead of distinct nodules there are local swellings in the iris-tissue, the membrane being attached at these situations by broad and moderately soft synechiae to the capsule of the crystalline lens. Gummatous iritis, -gumma of the iris, - occurs in the late or tertiary period of syphilis, and is characterised by the development of large yellowish nodules, usually on the ciliary border of the iris and strongly analogous to gummata in other situations. Sometimes at this late stage an iritis unassociated with nodules appears, somewhat resembling the plastic type of the disease, and probably the relapse of a plastic iritis which occurred at an early stage, owing to failure in the absorption of the original synechiae. Serous iritis, or more properly serous cyclitis, is an unusual variety of iritis as the result of acquired syphilis, although from other causes common enough. It is characterised by a serious or seroplastic exudate, deepening of the anterior chamber, slight dilatation of the pupil, haziness of the cornea, and opaque dots on its posterior elastic membrane arranged in a triangular manner. Provided the cases are seen early,

before adhesions form and much exudation pours out into the pupillary space, causing either its occlusion or its occlusion, the prognosis of the various forms of iritis is not unfavourable. When thoroughly cured, relapses are infrequent. Commonly both eyes are attacked, one a little later than the other; sometimes they are both involved at the same time. Syphilis may be the cause of subacute, chronic, and so-called quiet iritis, in which there is not much pain, if any, or ciliary congestion, the progressive dimness of vision being the only thing which suggests its occurrence. Syphilis of the ciliary body is uncommon, apart from the fact that this structure is commonly involved in all the severe types of inflammation of the iris, forming the so-called iridocyclitis, and also that serous iritis is really a manifestation of the inflammation of the ciliary body. Occasionally there are gummata which have their seat in the iris as well as the ciliary body, and may in the course of their growth perforate the coverings of the eye, thus causing its destruction.

Inflammation of the choroid may in the same manner accompany iritis, but an independent syphilitic choroiditis may occur. Diffuse exudative choroiditis is, moreover, frequently caused by syphilis; as also choroiditis centralis, in which the place of the macula is occupied by a copious exudation that later on changes to a bluish-gray mass of connective tissue. Choroiditis becomes dangerous when cloudiness of the crystalline lens occurs or if the retina or the optic nerve is involved. The syphilitic forms of choroiditis cannot be distinguished from the idiopathic forms. There are several kinds of syphilitic retinitis. The first variety, originally called choroidoretinitis, is really a disease of the choroid. The most important symptoms are opacity of the vitreous, - syphilitic hyalitis, - usually in the form of dust-like particles; loss of transparency of the retina around the head of the optic nerve, which is unduly hyperaemic; and numerous yellow or white spots of exudation bounded by pigment lying beneath the vessels of the retina. Vision is much affected, especially in dim lights, the field of vision is contracted, and the patient complains of shimmerings, spots, circles, dancing lights, and distortion of objects. Sometimes the disease is more truly located in the retina, which becomes affected with a gray opacity, the optic nerve entrance being yellowish-red in colour, while floating opacities arise in the vitreous; sometimes haemorrhages are observed. Of an unusual type and one belonging to the late manifestations is a central retinitis, located largely in the macular regions, and characterised by the appearance of numerous yellow or yellowish-white spots and dots of pigment. Inflammation of the retina usually appears from one to two years after infection, but sometimes as early as the sixth month. It usually affects both eyes. Syphilitic optic neuritis, characterised by swelling of the nerve-head, distention of the veins, which become darker in colour and tortuous, and haemorrhages upon the swollen papilla or in its immediate neighbourhood, may be caused by the formation of an intracranial product, for example, a

gumma, or may develop as an essential manifestation of the syphilitic attack. Besides atrophy of the optic nerve consecutive to improperly treated optic neuritis, a primary atrophy occurs, as well as the various types of degeneration of the nerve-head, which are due to general causes resulting from syphilis, tabes dorsalis, for example. The condition is manifested by progressive loss of vision, ever-increasing restriction of the visual field, and such opthalmoscopic appearances of atrophy as pallor of the disc, absence of capillaries, and shrinking of the size of the blood-vessels.

EAR.

The frequency of syphilitic affections of the ear has been variously estimated, some holding they are rather common and others that they are not. Chancres of the ear are only very exceptionally observed, the accident being due to either kissing or to drying the part with an infected towel. The pharyngeal opening of the Eustachian tube is not infrequently the seat of chancre, - the infection being carried by the Eustachian catheter, - of mucous patches, and of gummata. Cicatricial contraction following these lesions may completely block the tube. Macules, papules, pustules, and the various lesions arising therefrom, such as scales, ulcerations, and cicatrices, are not very infrequently found on the external and internal surface of the concha of the ear, on the tragus, and on the external auditory meatus in patients who are thickly covered also on the rest of the body. These are usually greatly neglected cases of syphilis. In exceptional instances we also meet with one or two papules in the external auditory canal where the syphiloderma is only moderately developed. Sometimes we find a papule in the external auditory large enough to interfere with hearing should the canal be naturally of rather narrow calibre. The occurrence of a papule on the membrane tympani will give rise to much more serious inconvenience. One may find a pale shining papule, the size of a hemp-seed, in the region of the handle of the malleus, this causing roaring sounds. Provided only the external part of the ear, including the meatus auditorius and the external layer of the drum of the ear, is involved a permanent loss of hearing is not usually likely to occur. The course of ulcerated papules is also favourable, even when they lead to flat or depressed scars in the auditory canal, generally attended by a falling of the little hairs in this part. Gummatous ulcerations are not often observed on the external ear, though sometimes seen in the auricle. Diffuse gummatous infiltrations lead to atrophy and contraction of the cartilages of the ear. Gummatous ulcerations may be encountered in the external auditory canal, as well as, in exceptional instances, a circular contraction of the part. Middle-ear lesions generally accompany a syphilitic pharyngitis and rhinitis; contraction or occlusion of the tube at the pharyngeal opening by syphilitic papules or gummatous nodules will be accompanied by temporary shrinking and contraction during cicatrisation with permanent loss of hearing. The otitis media in which

the inflammation is transmitted through the tube, as well as that which occurs independently in the course of syphilis, is accompanied by purulent inflammation and cloudiness of the membrana tympani, occasionally by its perforation, frequently with pain and with ringing in the ears. The bone conduction in complicating disease of the labyrinth is lowered and a return to the normal is very improbable. Following syphilitic affections there may be caries and necrosis of the tympanic cavity and also of the mastoid process and petrous portion of the temporal bone, occasionally with a fatal result. Affections of the auditory nerve and of the labyrinth, the cochlea, are very rarely observed during the period following shortly after infection. In the vast majority of instances, however, syphilitic lesions of the internal ear manifest themselves after the infection has already existed for a long time, and lead to either sudden or gradual development of deafness. Hearing is seldom recovered, though a few of the cases manifest a certain amount of improvement in their condition. A disease of the labyrinth occasionally develops in syphilitics, either in consequence of catching cold or without any apparent reason, which suddenly and permanently destroys the power of hearing. Bone conduction is diminished in this case, and the perception of high tones especially is lowered. The otitis is furthermore troublesome by causing noises in the ears, attacks of vertigo, and disturbances of equilibrium. The disease is generally bilateral, though one ear is usually more affected than the other. In certain cases auditory troubles point to the existence of brain syphilis, especially basilar meningitis; generally there is also present in this case a paresis of other cerebral nerves. Hallucinations of hearing may also be observed. Syphilitic affections of the labyrinth have the worst prognosis, and those of the external ear the best.

SENSE OF SMELL.

Syphilitic nasal affections not infrequently give rise to alterations in the sense of smell; and it would appear that the function is not infrequently disordered or abolished in not a few cases of cerebral syphilis, particularly basilar meningitis, as a result of disease of the olfactory nerve.

TASTE.

Specific lesions of the tongue and palate may give rise to disorders of taste; the same may arise also from central affections.

NERVOUS SYSTEM.

GENERAL CONSIDERATIONS.

The important and interesting subject of nerve-syphilis and best be considered by dealing with the lesions of the spinal cord separate from those of the cerebrum. Brain syphilis in its most characteristic or gummatous form usually attacks the cerebral meninges, or perhaps in some cases the perivascular sheaths of the vessels, and only secondarily affects the tissue of the brain itself. The importance of syphilitic affections of the brain-cortex is so great that a special section will be devoted to its consideration.

It seems established that, with or without other cerebral lesion, the vessels of the brain may undergo an atheromatous degeneration as the direct result of a syphilitic dyscrasia; but also disease of the general vascular system, and on the other cerebral apoplexies, softenings, and other degenerations. It is difficult to say why in any given cases syphilis selects one portion of the nervous centres rather than another for its machinations; only seldom can we determine the existence of any predisposing cause. It may reasonably be believed that anything which is capable of exciting an inflammation of a nerve-centre may, when present in a syphilitic individual, provoke a specific disease of such centre. Thus, thermic fever is a very common cause of chronic meningitis, and cases are on record in which cerebral syphilis followed a sunstroke or long-continued exposure to the sun's rays. Nerve-syphilis, we would think, might be excited by blows and other traumatisms; but, as a matter of fact, this is only rarely the case. Some of the patients attribute their disease to violence, and several cases of possible specific spinal disease, due to such factors as a fall on ice, a fall from a cart, and a kick from a horse, are on record. Not a few writers attach considerable importance to over-study and other forms of cerebral strain in exciting brain syphilis. Engelstedt seems to have reported instances having such etiological relations, and Fournier (Brain Syphilis) affirms that he has especially seen the disease in professional men and other persons exercising their brains to excess. Other authorities say that they have never seen a case in private or public practice where over-brainwork could be considered a distinct etiological factor, whilst they have seen some hundreds of cases from amongst the labouring classes, in whom the intellectual faculties are mostly dormant. On the whole, it would seem that in the vast majority of instances no exciting cause of the nervous location of the disease can be discovered. The question of hereditary influence will later on receive due consideration. A very important question connected with this subject is the time of development of the lesions. Nervous diseases following acquired syphilitic infection certainly belong to the advanced stages of the disorder. Huebner (Ziemmsen's Ency. of the Prac. of Med.,xii.,298) reports a case in which thirty years elapsed between the contraction of the chancre and the nervous explosion. Fournier (loc. cit.) reports intervals of twenty-five years, and thinks that from the third to the tenth year is the period of maximum frequency of nervous lesions. The fact that specific nervous lesions may develop many years after the cessation of all apparent evidences of the diathesis is of great practical importance, especially as the nervous system is more prone to be attacked when the secondary symptoms have been slight than when the earlier manifestations have been severe. One repeatedly sees nervous syphilis in individuals whose secondaries have been so slight as to have been entirely overlooked or forgotten, and who honestly assert that they have never had syphilis, although they admit to have had gonorrhoea

or to have undergone exposure, and confess that their asserted exemption is due rather to good luck than morality. Thus, Dowse (The Brain and Its Diseases, 1879, Vol.i.,p.7) tells us that: "Often have I had patients totally ignorant of having at any time acquired or experienced this signs or symptoms of syphilis in its primary and secondary stages, yet the sequelae have been made manifest in many ways, particularly in many of the obscure diseases of the nervous system." Buzzard (Syphilitic Nervous Affections, 1874,p.80) reports a case of nervous syphilis where the patient was unconscious of the previous existence of a chancre or of any secondary symptoms. Rinecker (Arch.f.Psychiatrie,vii.,p.241) also calls attention to the frequency of the nervous syphilitic affections in individuals who present no distinct history of secondary troubles; and the instances of such experience might be multiplied, if necessary. Despite the fact that syphilis is prone to attack the nervous system many years after infection, it would be a fatal mistake to suppose that nervous disease may not rapidly follow the chancre. What is the minimum possible intermediate period we do not know, but it is certainly very brief, and is shown by the following cases of this so-called precocious nervous syphilis: Ljunggrèn (Arch. f.Derm.u.Syph.,1870,ii.,p.155) reports a case of a patient who had syphilitic chancre, in March, which rapidly healed, followed, in May of the same year, by severe headache, mental confusion, and giddiness. Early in July the patient had an epileptic attack, but was finally cured by active specific medication. Although the history is not explicit, the nervous symptoms seem to have receded the occurrence of distinct secondary phenomena other than pains of a rheumatic character. Davaine (Cited by Buzzard. - loc. cit.) is said to have seen paralysis of the portio dura a month after the first symptoms of constitutional syphilis appeared. E. Leyden (Zeit.f.kiln.Med.,Bd.5,165) found advanced syphilitic degeneration of the cerebral arteries in a man who had contracted syphilis a year previously. R.W.Taylor (Jour.Nerv.& Ment.Dis.,1876, p.38) describes a case in which epilepsy occurred five months after the infection. In a case reported by A Schwarz(On Early Syphilitic Hemiplegia,Inaug.Dise., Paris,1880), headache came on the fortieth day after the appearance of the primary sore, and a hemiplegia upon the forty-sixth day. Another of his patients had a paralytic stroke with prodromes six months after the chancre, and a third patient had an apoplectic attack seven months after the initial sclerosis, and another the same five months thereafter. In yet another case the chancre appeared after a period of incubation of twenty-six days, and two months and eight days subsequent to this came the first fit; eight days after the first the second convulsion occurred, with a distinct aura, which preceded by some minutes the unconsciousness. E. Gaucher (Rev.de Méd.,1882,ii.,678) tells of spinal syphilis occurring six months after the development of the initial product of the infecting coitus. Many other equally interesting instances appear in the literature; and it would appear that nervous syphilis

in not a few cases has become manifested within twenty-four weeks after inoculation, and may be seen within eight weeks after that event.

CEREBRAL SYPHILIS.

We have seen that it may express itself by the development of gummata in the brain; and it is quite possible for cerebral syphilis of this type to make its appearance with remarkable suddenness, the first indication thereof perhaps being an attack of apoplexy, a convulsive peroxysm, a violent mania, or a paralytic stroke. In most of these cases the occurrence ought to have been forseen, and to a greater or less degree averted. The onset of brain syphilis is, however, generally more gradual, the symptoms developing slowly and successively. Proper treatment, commenced at an early stage, is usually successful, so that a careful study of these prodromes is most important. They are usually such as denote cerebral disturbance, and, although they should excite suspicion, are not diagnostic, except as occurring in connection with a syphilitic history or under suspicious conditions. Headache, slight failure of memory, unusual slowness of speech, general lassitude, and especially disinclination for mental exertion, insomnia or excessive somnolence, attacks of momentary giddiness, vertiginous sensations when straining at stool, yelling or in any way disturbing the cerebral circulation, alteration of disposition, - any of these, and, a fortiori, several of them, occurring in a syphilitic subject, should be the immediate signal for alarm, and lead to the examination of the optic discs; for in some cases the eye-ground will be found altered, even during the prodromal stage. Of course, if choked disc be found, the diagnosis becomes practically certain; but the absence of choked disc is no proof that the patient is free from cerebral syphilis. No special importance can be attached to any of the prodromal symptoms, although perhaps headache is the most common. There is one symptom which may occur during the prodromal stage of cerebral syphilis, but is more frequent at a later stage, - a symptom which is not absolutely characteristic of the disease, but which, when it occurs in a person who is not hysterical, should give rise to the strongest suspicion: the occurrence of repeated, partial, passing palsies. A momentary weakness of one arm, drawing of the toe, a partial aphasia which appears and disappears, a squint which to-morrow leaves no trace, may be due to a non-specific cerebral tumour, to miliary cerebral aneurysms, or to some other non-syphilitic disease; but in the vast majority of cases where such phenomena occur repeatedly the patient is either hysterical or syphilitic. Syphilitic cerebral meningitis of the acute type is perhaps the most common form of brain syphilis, and usually to some extent complicates all other forms of specific cerebral disease. It is doubtful if an acute syphilitic meningitis can ever develop as a primary lesion, if it is not always preceded by a chronic meningitis or by the formation of a gummatous tumour; but it is very certain that acute meningitis may occur when there have been no apparent symptoms, and may therefore seem to be abrupt in its onset. On the other hand an

acute attack is liable at any time to supervene upon a chronic syphilitic meningitis. In one of Gamel's (Gummatous Tumours of the Brain, Inaig.Diss., Montp., 1875) cases there were intense headache, fever, and delirium, which came on abruptly in an old syphilitic subject and ended in general paralysis and death; here the symptoms were found to depend upon an acute meningitis secondary to a large gummatous infiltration of the brain. Molinier (Rev.Méd. de Toulouse, xiv., 1880, 341) cites a case in which violent delirium, convulsions, and coma occurred suddenly. A very curious case is reported by Zambaco (On Nervous Syphilitic Affections, Paris, 1862, p.485), in which attacks simulating acute meningitis, occurring in a man with a cerebral gummatous tumour, appear to have been malarial. In such a case the diagnosis of a malarial paroxysm could only be made out by the presence of the cold stage, the transient nature of the attack, its disappearance with a sweat, its periodical recurrence, and the therapeutic effect of quinine. In the recorded cases of cerebral brain syphilis most usually, after a greater or less continuance of prodromes such as have been mentioned above, epileptic attacks have occurred with a hemiplegia, or a monoplegia, which is almost invariably incomplete and usually progressive; very frequently diplopia is manifested before the epilepsy, and on careful examination is found to be due to weakness of some of the ocular muscles. Not rarely oculomotor palsy is an early and pronounced symptom, and a marked paralytic squint is very common. Along with the development of these symptoms there is almost always distinct failure of the general health and progressive intellectual deterioration, as shown by loss of memory, failure of the power to fix the attention, mental bewilderment, and perhaps aphasia. If the case convalesce under treatment, the amelioration is gradual, and the patient slowly regaining his health. If the case end fatally, it is usually by a gradual sinking into complete paralysis, or the patient is carried off by an acute inflammatory exacerbation, or amelioration may be rapidly occurring and a very violent epileptic fit produce a sudden fatal asphyxia. Death from brain-softening around the tumour is not infrequent, but it is seldom that a fatal apoplectic haemorrhage is observed. There are numerous and varied phenomena observed in connection with cerebral meningeal syphilis. Fournier separates them into cephalic, congestive, epileptic, aphasic, mental, and paralytic; but does little thereby to systematise the subject. Heubner (loc. cit.) recognises the following types: First, - psychical disturbances, with epilepsy, incomplete paralysis, - seldom of the cranial nerves, - and a final comatose condition, usually of short duration. Second, - genuine apoplectic attacks with succeeding hemiplegia, in connection with peculiar somnolent conditions, occurring in frequently repeated episodes; frequently phenomena of unilateral irritation, and generally at the same time paralysis of the cerebral nerves. Third, - course of the cerebral disease similar to paralytic dementia. The latter type seems clear and well defined, but contains those cases which

will be considered later under the heading of cortical affections. Meningitèal syphilis as we observe it does not conform rigidly with the other asserted types, although there is much of agreement in the respect that, when the epilepsy is pronounced, the basal cranial nerves are not usually paralysed, the reason for this being that epilepsy is especially produced when the gummatous change is in the ventricles or on the upper cortex. In basal affections the epileptoid spells, if they occur at all, are usually of the form of petit mal; but this rule is general, not absolute. The apoplectic somnolent form of cerebral syphilis, for some reason, is comparatively rare; and it seems desirable to add to those of Hubner's a fourth type to which a large proportion of cases conform. This type is characterised by psychical disturbance without complete epileptic convulsions, associated with palsy of the basal nerves and often with partial hemiplegia. The best way of dealing with the subject, however, is to consider the important symptoms separately, rather than attempt to arrange them into recognisable varieties of the disease. Syphilitic headache is one of the most violent forms of headache, and is characterised by its remarkable constancy. It is usually the earliest symptom of meningeal syphilis; but it may be absent, especially when the lesion is located in the reflections of the meninges which dip into the ventricles, or when the basal gumma is small and not surrounded with much inflammation. The length of time it may continue without the development of other distinct symptoms is remarkable. The patient may have it for years before any other symptoms of the disease appear. It never entirely ceases, although at times there are paroxysms in which the pain is so intense as to cause great agony; during the sleep the patient is able to get he is moaning or tossing about in his bed. It sometimes disappears when other manifeatations develop. It varies almost indefinitely in its type, but is, exceptin very rare instances, at least so far paroxysmal as to be subject to pronounced exacerbations. In most cases it is entirely paroxysmal; and a curious circumstance is that very often these paroxysms may occur only at long intervals: such distant paroxysms are usually very severe, and are often accompanied by dizziness, sickness, partial unconsciousness, or even by more marked congestive symptoms. The pain may seen to fill the whole cranium, may be located in a cerebral region, or fixed in a limited spot. Huebner (loc. cit.) asserts that when this headache can be localised it is generally made distinctly worse by pressure at certain points, though certain authors deny this observation, stating that any such soreness cannot directly depend upon the cerebral lesion, but must be a reflex phenomenon or due to a neuritis. Localised soreness seems to indicate an affection of the bone or its periosteum. There are in many cases distinct nocturnal exacerbations, especially when the headache is persistent. On the whole, there is nothing absolutely characteristic in the headache of cerebral syphilis; but excessive persistency, apparent carelessness, a tendency to nocturnal exacerbation should in any cephalalgia excite suspicion

of a specific origin - a suspicion which is always to be increased by the occurrence of slight spells of giddiness or by delerious mental wandering accompanying the paroxysms of pain. When an acute inflammatory attack supervenes upon a syphilitic meningeal disease, it is generally ushered in with a torturing headache. When the cephalalgia in any case is habitually very constant and severe, the disease is probably in the dura mater or periosteum; and this probably is much increased if the pain be local and increased by firm, hard pressure upon the skull over the site of the pain. There are two different disorders of sleep, either of which may occur in cerebral syphilis. Insomnia is more apt to be troublesome in the prodromal than in the later stages, and is only of significance when combined with other more characteristic symptoms. A peculiar somnolence is of much more determinate import. It is not pathognomonic of cerebral syphilis, but is the most characteristic of all the single phenomena of the disease. Its absence in any individual case is of no import. It occurs in two forms: in the one variety the patients sit all day long in bed in a state of semi-stupor, indifferent to everything, but capable of being aroused, answering questions slowly, imperfectly, but without complaint, but in an instant dropping off again into quietude. In the other variety the sufferer may still be able to work, but often falls asleep when at his tasks, and especially towards evening has an irresistible desire to slumber, which leads him to pass, it may be, half of his time in sleep. This state of partial sleep may precede that of the more continuous stupor, or may pass off when an attack of hemiplegia seems to divert the symptoms. The mental phenomena in the more severe cases of somnolency are peculiar. The patient can be aroused: indeed, in many instances he exists in a state of stupor rather than of sleep; when stirred up he thinks with extreme slowness, and may appear to have a form of aphasia; yet at intervals he may be endowed with a peculiar automatic activity, especially at night. Getting out of bed; wandering aimlessly and seemingly without knowledge of where he is, and unable to find his own bed; passing his excretions in a corner of the room (in or) other similar place, not because he is unable to control his bladder and bowels, but because he believes he is in a proper place for such act: he seems in a restless nocturnal automaton condition, rather than that of a man. In some cases the patient lies in a state of continuous stupor. It is important in connection with this somnolence to note that it may develop suddenly without marked premonition. Thus, in a case reported by Ormerod (Brain,Vol.v.,260) a man who had been in good health, save only for headache, awoke one morning in a semi-delirious condition, and for three days slept steadily, only arousing for meals; after this there were impairment of memory and mental faculties, but no more marked phenomena. Apathy and indifference are the characteristics of the somnolent state, yet the patient will sometimes show excessive irritability when aroused, and will at other periods complain bitterly of pain in his head, or will groan as though suffering severely in

the midst of his stupor - at a time, too, when he is not able to recognise the seat of the pain. One may find a patient with a vacant, apathetic face, almost complete aphasia, persistent heaviness and stupor, arouse himself on visitors coming into the room, and come forward with a dazed, highly pathetic manner, by signs and broken utterances begging for something to relieve his head. Heubner speaks of cases in which the irritability was such that the patient fought vigorously when aroused. This somnolent condition may last perhaps for several weeks. Buzzard (Clinical Lectures on Diseases of the Nervous System,1882) described a case of a man who after a syphilitic hemiplegia lay silent and somnolent for a month, and yet finally recovered so completely as to win a rowing-match on the Thames. Even after four months' somnolence a fair degree of recovery may be observed. In its excessive degree of development syphilitic stupor takes on the characteristics of advanced brain-softening, to which it is indeed often due. This close connection between it and brain softening explains the clinical fact that apoplectic haemorrhage is very apt to end the life in these cases of somnolent syphilis. But a prolonged deep stupor in persons suffering from cerebral syphilis does not prove the existence of extensive brain-softening, and is not incompatible with subsequent complete recovery. These cases are serious, but not necessarily fatal. When it is remembered that a syphilitic exudation may appear at almost any position in the brain, that spots of encephalic softening are not a rare result of the infection; that syphilitic disease is a common cause of cerebral haemorrhage, it is evident that a syphilitic palsy may be of any conceivable variety, and effect either the sensory, motor, or intellectual sphere. The mode of onset is Various,- sudden, or gradual. The gradual development of the syphilitic gumma would lead us, a priori, to expect an equally gradual development of the palsy; but experience shows that in a large proportion of the cases the paralysis appears suddenly, with or without the occurrence of an apoplectic or epileptic fit. Under these circumstances it will usually be noted that the resulting palsy is incomplete; in rare instances it may be at its worst when the patient awakes from the apoplectic seizure, but usually it progressively increases for a few hours, and then becomes stationary. These sudden partial palsies probably result from an intense congestion around the seat of disease or from stoppage of the circulation in the same locality; whatever their mechanism may be, it is important to distinguish them from palsies which are due to haemorrhage. The degree of the palsy will provide the means. In all probability a suddenly-developed, complete hemiplegia or other paralysis may be considered as either haemorrhage or produced by a thrombus so large that the results will be disorganisation of the cerebral substance, and a future no more hopeful than that of a clot. On the other hand, an incomplete paralysis may be rationally regarded as due to pressure or other removable cause; and this belief is considerably strengthened by a gradual development. The prognosis is obviously

affected by these facts. Although the gummatous deposit may develop at almost any point, they especially affect the base of the brain, and are prone to involve the nerves which issue from it. Morbid exudations, not tubercular or syphilitic, are rare in this region. Hence a rapidly but not abruptly appearing strabismus, ptosis, dilated pupil, or any paralytic ocular symptom in the adult is generally of a syphilitic nature. Syphilitic facial palsy is not so frequent, whilst palsy of the nerve from rheumatic or other inflammation within its bony canal is very common. Paralysis of the facial nerve may therefore be specific, but existing alone is of no diagnostic value. Since syphilitic palsies about the head are in most instances due to pressure upon the trunks of the nerves, the affected muscles show the electrical reactions of degeneration. A temporary, transient, fugitive, palsy, varying in character and seat, is peculiar and often observed. Thus, an arm may be weak today, strong tomorrow, and the next day feeble again, or the recovered arm may retain its power and a leg fail in its stead. These transient palsies are much more apt to involve large than small areas of the brain. The explanation of their largeness, fugitiveness, and incompleteness is that they are not entirely due to clots or other structural changes, but to congestions of the brain tissues in the neighbourhood of gummatous exudations. Strabismus due to direct pressure on the nerve will remain when the accompanying monoplegia due to congestion vanishes. Motor paralyses are more common than sensory affections in syphilis, but hemianaesthesia, localised anaesthetic tracts, indeed any form of sensory paralysis, may occur. Numbness, formications, all varieties of paraesthesia, are frequently felt in the face, body, and extremities. Violent peripheral neuralgic pains are rare, and generally when present denote neuritis. Huguenin, however, reports (Schwiez.Corr.Blatt.,1875) a severe trigeminal anaesthesia dolorosa, which was found, after death from intercurrent disease, to have depended upon a small gummata pressing upon the Gasserian ganglion. Hamilton (Alienist and Neurologist, iv.,58) and others have described similar instances. The special senses are prone to suffer from cerebral syphilis, and the resulting palsies follow courses and have clinical histories parallel to those of the motor sphere. The onset may be sudden or gradual, the result temporary or permanent. Mauriac (loc. cit.) tells of a case in which the patient was frequently seized with sudden attacks of severe frontal pain and complete blindness lasting from a quarter to half an hour; at other times the same patient has spells of aphasia lasting from one to two minutes. Like other syphilitic palsies, therefore, paralyses of special senses may come on suddenly or gradually, and may present a paroxysmal explosion. Aphasia may be classed amongst the palsies of cerebral syphilis. An examination of the recorded cases shows that syphilitic aphasia is subject to vagaries and laws similar to those connected with other specific cerebral palsies. It is generally a symptom of advanced disease, but may certainly develop as one of the evidences

of cerebral syphilis. Coming on after an apoplectic or epileptic fit, it may be complete or incomplete; owing to the smallness of the centre involved and the ease with which its function is held in abeyance, a total loss of word-thought is not so decisive as to the existence of cerebral haemorrhage as in total motor palsy. Like hemiplegia and monoplegia, specific aphasia is sometimes transitory and paroxysmal. Buzzard (loc. cit.,p.81) records several such cases. Mauriac (Aphasia and Right Hemiplegia in Syphilis, Paris,1877) details a very curious case in which a patient, after long suffering from headache, was seized with a sudden loss of power in the right hand and fingers, lasting about ten minutes only, but recurring many times a day. After this had continued some time the paroxysms became more completely paralytic, and were accompanied by loss of power of finding words, the height of the crises in the palsy and aphasia being simultaneously reached. For a whole month these attacks occurred five or six times a day, without other symptoms except headache, and then the patient became persistently paralytic and aphasic, but finally recovered. Syphilis may include every conceivable form of aphasia, to describe which would require a full narration of aphasia itself. Owing to the centres of speech being situated in the cortical portion of the brain, aphasia in cerebral syphilis is very frequently associated with epilepsy. Of course, right-sided palsy and aphasia are united in syphilitics as in sufferers from other diseases. If, however, the statistics given by Tanowsky (Syphilitic Aphasia) be reliable, syphilitic aphasia is associated with left-sided hemiplegia in a most extraordinarily large proportion. Thus, in fifty-three cases collected by him, eighteen times was there right-sided hemiplegia, and fourteen times left-sided hemiplegia, the other cases being not at all hemiplegia. Judging from the autopsy on a case reported by Mauriac (loc. cit.), this occurrence of left-sided paralysis and aphasia depends partly upon the great frequency of multiple brain lesions in syphilis, and partly upon the habitual involvement of large territories of the gray matter secondarily to diseased membrane. An important practical deduction is that the conjoint existence of left hemiplegia and aphasia is almost diagnostic of brain syphilis. Probably amongst the palsies may be considered the disturbances of renal functions, which are only seldom encountered in cerebral syphilis, and which are probably usually dependent upon the specific exudation pressing upon the vasomotor centres in the medulla. Fournier refers to his notes of six cases in which polyuria with its accompaniment, polydipsia, was present, and describes a case in which the specific growth was found in the floor of the fourth ventricle. Cases have been reported of true saccharine diabetes due to cerebral syphilis (Servantiè. - Reports on Diabetes and Syphilis,Thèse de Paris, 1876; Putzel. - Med. Rec.,xxv.,450; etc.) Mercury and iodides have a markedly beneficial effect on these cases. The influence of syphilis in the production of epilepsy is one of very great importance. Not only has specific epilepsy

characteristics of its own, but its origin may be distinctly traced to syphilitic infection. Cases dependent upon gross cerebral disease, such as meningitis and gumma, are excluded from consideration; but it is conceded by all syphilographers that an epilepsy may mark the second stage of the disorder, and its pathological importance is considered by some to be probably a simple vascular disturbance which cannot be determined after death. The affection is sometimes hereditary. Fournier long ago taught that an epilepsy appearing after thirty years of age was very rarely, if ever, essential epilepsy, and unless alcoholism, uraemic poisoning, or other adequate cause could be found was in nine cases out of every ten specific. Syphilitic epilepsy may occur either in the form of petit mal or of haut mal, and in either case may take on the exact characters and sequence of phenomena which belong to the so-called idiopathic or essential epilepsy. The momentary loss of consciousness of petit mal will usually, however, be found to be associated with attacks in which, although voluntary power is suspended, memory recalls what has happened during the paroxysm - attacks, therefore, which simulate those of hysteria, and which lead to diagnostic mistakes. Even in the fully-developed type of the convulsions the aura is only seldom present. Its absence, however, is not of diagnostic value, because it is frequently not present in essential epilepsy, and it may be pronounced in the specific disease. It is said that when in an individual case the aura has once appeared the same type of form or approach of the convulsion is thereafter rigidly adhered to. The aura is sometimes bizarre: a severe pain in the foot, a localised cramp, a peculiar sensation, indescribable and unreal in its feeling, may be the first warning of the attack. An aura may affect a special sense. Blindness, for instance, may usher in the attacks. In many, perhaps most, cases of specific convulsions, instead of paroxysms of essential epilepsy being closely simulated, the movements are in the onset, or more rarely throughout the paroxysms, unilateral, indeed, they may be confined to one extremity. This restriction of movement has been held to be almost characteristic of syphilitic epilepsy, but it is not so. Whatever diagnostic significance such restriction of the convulsion has is simply to indicate that the fit is due to a cortical organic lesion of some kind. Tumors, scleroses, and other organic lesions of the cerebral cortex are as prone to cause unilateral or monplegic epilepsy when they are not syphilitic as when they are due to the luetic affection. Sometimes an epilepsy dependent upon a syphilitic lesion implicating the cerebral cortex may be replaced by a spasm which is more or less local and is not attended with any loss of consciousness. There sometimes occur cases of cerebral syphilis in which widespread general spasms occur similar to those of a Jacksonian epilepsy, except that consciousness is not lost, because the nervous discharge does not overwhelm the centres which are connected with consciousness. On the other hand, these epileptoid spasmodic cases link themselves to those in which the local brain lesion manifests itself in contractions or persistent irregular

clonic speasma. Contractures may exist and simulate those of descending degeneration. Syphilitic athetosis is not unknown (Lancet,1883,ii,989). The clonic spasms of cerebral syphilis may assume a distinctly choreic type, or may in their severity simulate those of hysteria, throwing the body about violently. It is misleading, and therefore improper, to call such cases syphilitic chorea, as there is no reason for believing that they have a direct relation with ordinary chorea. They are the expression of an organic irritation of the cerebral cortex, and are sometimes followed by paralysis of the affected member; in other words, the disease, progressing inward from the membranes of the brain, first irritates, and then so invades a cortical centre as to destroy its functional power. We have already seen that somnolence, loss of memory, and general mental failure are the most frequent and characteristic mental symptoms of meningeal syphilis; but, as we shall presently understand, syphilis is able to produce almost any form of insanity, and therefore mania, melancholia, erotic mania, delirium of grandeur, etc., may develop along with the ordinary manifestations of cerebral syphilis, or may come on during an attack which has hitherto produced only the usual symptoms. Erlenmeyer (On Luetic Psychoses) reports a case in which an attack of violent headache and vomiting was followed by paralysis of the right arm and paresis of the left leg, with some mental depression; a little later the patient suddenly became very cheerful, and shortly afterwards manifested very distinctly delirium of grandeur with failure of memory. Tuke (Jour.Med.Sci.,Jan.,1874,p.560) once reported a case in which, with aphasia, muscular wasting, squint, and various paralyses, there were delusions and hallucinations. Williams (ibid.,April, 1869) describes a case in which there were paroxysmal violent attacks of frontal headache. The woman was very dirty in her habits, only ate when fed, and existed in a state of hypochondriacal melancholy. Leiderdorf (Med.Jahr.,xx.,1864,p.114) had a patient with headache, partial hemiplegia, great psychical disturbance, irritability, change of character, marked delirium of grandeur, epileptic attacks, and finally dementia, who was ultimately cured by potassium iodide. Manssurow (On Tertiary Syphilis,1877) and others have reported cases of various forms of insanity of syphilitic origin. That the attacks of syphilitic insanity, like the paralyses of syphilis, may at times be transitory and fugitive, is shown by a curious case reported by Newington (Jour.Ment.Sci.,xix,555), in which, along with headache, failure of memory, and ptosis, there was a short paroxysm of insanity of a noisy and troublesome character. It is necessary for the diagnosis of cerebral syphilis that a correct history of the antecedents of the patient may be obtained. Since very few of the first manifestations of the disease are absolutely characteristic, whilst almost any conceivable cerebral symptoms may arise from syphilitic lesions, treatment should be commenced immediately on the appearance of cerebral phenomena in a person known to have been infected. The history of the case is often defective, and not

infrequently misleading. Patients often appear to have no suspicion of the nature of their malady, and will deny the possibility of syphilis, although they confess to habitual immorality. Indeed, inquiries are so often misleading in their results that one should attach little importance to the statements of the patients, and avoid asking questions which might recall unpleasant memories; rather should we rely upon the symptoms actually presented for the recognition of the trouble. After the exclusion of other non-specific disease, headache occurring with any form of ocular palsy or with the history of attack of partial monoplegia or hemiplegia, vertigo, petit mal, epileptoid convulsions, or disturbances of consciousness, or attacks of unilateral or localised spasms, should lead to the practical therapeutic test. Ocular palsies, epileptic forms of attacks occurring after thirty years of age, morbid somnolence, even when existing alone, are sufficient to arouse suspicion. It is sometimes of vital importance that the nature of the cephalalgia shall be recognised before the coming on of more serious symptoms; any apparent carelessness, severity, and persistency should awaken suspicion, to be much increased by a tendency to nocturnal exacerbations or by the occurrence of mental disturbance or of giddiness at the crises of the paroxysms. Not rarely there are very early in these cases curious, almost indefinable, disturbances of the cerebral functions, which may be easily overlooked, such as temporary and partial failures of memory, work-stumbling, fleeting feelings of numbness and weakness, alterations of disposition. In the absence of hysteria an indefinite and apparently disconnected series of nerve accidents is of very urgent importance. A random association or a random succession of nervous symptoms is very strong reason for a diagnosis of a syphilitic lesion of the nervous system. Cerebral syphilis occurring in an hysterical subject may be readily overlooked until fatal mischief is done. When any paralysis occurs, a study of the reflexes may sometimes lead to a correct diagnosis. Thus, in a hemiplegic the reflex on the affected side in cerebral syphilis is very frequently exaggerated, whilst in hysteria the reflexes are usually alike on both sides. When both motion and sensation are disturbed in an organic hemiplegia, the anaesthesia and motor paralysis occur on the same side of the body, whilst they are generally on opposite sides in hysterical disease. In every case of doubtful diagnosis the therapeutic test should be tried; and if a drachm of iodide of potassium per diem fails to produce iodism, for all practical purposes the patient may be considered syphilitic. It may be noted, however, that Segium has denied the validity of this; but it would seem that some of his reported cases were suffering from unsuspected syphilis. It cannot be denied that there are rare individuals who, although untainted, can resist the action of the iodide; but those of large experience in the management of the disease would certainly indicate that there are only a few such cases ever encountered. Of course, in formulating this opinion one must leave out of consideration persons who have by long custom become accustomed to the use of the

iodide; for although in most cases such use begets increase and susceptibility, the contrary sometimes occurs. Of course, it would be foolish to say that a patient who did not respond to the iodide had syphilis; but it is nevertheless true that it would be even more culpable to refrain from acting on such a basis. It is very difficult to prognosticate with certainty in any given case of cerebral meningeal syphilis, as the disease varies so greatly and so unexpectedly in its course. The general rules of prognosis in cerebral disease obtain to some extent, but may always be favourably modified, and patients apparently at the point of death will frequently recover under treatment. The prognosis is not, however, as absolutely favourable as is sometimes believed, and especially should patients be warned of the probable recurrence of the affection when the symptoms have entirely disappeared. The only safety after the restoration of health consists in an immediate renewal of treatment upon the recurrence of the slightest symptom. The occurrence of a complete, sudden hemiplegia or monoplegia is sufficient to render probable the existence of a clot, which must be subject to the same laws as though not secondary to a syphilitic lesion. If a rapid decided rise of temperature occur in an apoplectic or epileptic attack, the prognosis becomes very grave. An epileptic paroxysm seldom causes death. The prediction of the future in gummatous cerebral syphilis should be guardedly favourable. In the vast majority of instances a more or less incomplete recovery occurs under appropriate treatment; and one repeatedly sees patients who are unconscious, with urinary and faecal incontinence, and apparently dying, recover. Nevertheless, so long as there is any particle of gummatous inflammation in the membrane the patient is liable to sudden congestion of the brain, which may prove rapidly fatal, or he may die in a brief epileptic fit. On the one hand, there is an element of uncertainty in the most favourable case, and on the other it is not warrantable to give up a case as hopeless so long as there is the slightest chance of the patient recovering. Gummatous inflammation of the brain most likely always has its origin in the cerebral meninges, although it may be located within the brain itself; thus, gummata may be seen arising from the velum interpositum in the lateral ventricle. The disease most often attacks the base of the brain, and is especially found in the neighbourhood of the pons Varolii and the optic tract. It may, however, locate itself on the vault of the cranium, by preference the anterior or motor regions. The mass may be well-defined and roundish; but more usually it is spread out, irregular in shape, and more or less confluent with the substance of the brain beneath it. It varies in size from a line to several inches in length, and, when small, is apt to undergo multiplication. The only lesion which it resembles in gross appearance is tubercle; histology alone will effect a differentiation. Not infrequently the large gummata have two distinct zones, the inner one of which is drier, somewhat yellowish in colour, opaque, and resembles the region of caseous degeneration

in the tubercle. The outer zone is more pinkish and more vascular, and is semitransparent. The most characteristic histological structures are small cells, such as are found in gummatous neoplasms in other portions of the body. These cells are most abundant in the inner zone, which, indeed, may be entirely composed of them. In the centre of the tumour they are more or less granular and atrophied; in some cases the caseous degeneration has progressed so far that the centre of the gumma consists of minute acicular crystals of fat. In the external or peripheral zone of the tumour the mass may pass imperceptibly into the normal nerve tissue, and under these circumstances it is that it contains the spider-shaped cells of stellate bodies described by Jastrowitch, and especially commented upon by Charcot and Gombault and Coyne. These are large cells containing an exaggerated nucleus and a granular protoplasm, which continues into multiple, branching , rigid, refracting prolongations, which prolongations are scarcely stained by carmine. Alongside of these cells other largish cells are found without prolongations, but furnished with oval nuclei and granular protoplasm. Amongst these cells will be seen the true gummatous cells, as well as the more or less altered neuroglia and nerve elements. In the perivascular lymphatic sheaths in the outer cell of the gumma is usually a great abundance of small cells. The spider-shaped cells are probably hypertrophied normal cells of the neuroglia, and have been considered by Charcot and Gombault as characteristic of syphilitic gummata of the brain. In a solitary gumma, however, of considerable size from the neighbourhood of the cerebellum, studied by Coyne and Peltier, there were no stellate cells. Coyne considers that their presence is due to their previous existence in the normal state of the regions affected by the gumma. In cases of recovery it is difficult to determine exactly what becomes of the syphilitic gumma of the brain. It is certain that they become softened and disappear more or less completely, and it is probable that the cicatrices or small peripheral cysts which are not rarely found in the surfaces of the brain are sometimes remnants of gummatous neoplasms. In a number of cases collected by Gros and others there were small areas of softened tissue or small calcareous masses or cerebral lacunae corresponding to the cicatrices of softening or imperfect cysts, coincident with the evidences of syphilis elsewhere. Cornil also affirms that he has found small areas of softening with well-established syphilitic lesions of the dura mater and cranium, but thinks that the lacunae or cysts depend rather upon chronic syphilitic lesions of cerebral arteries than upon gummatous inflammation. In such cases as a gummatous neoplasm comes in contact with an artery, the latter is generally compressed and its walls undergo degeneration. The specific arteritis may pass beyond the limit of the syphiloma and extend along the wall of the vessel. Not infrequently there is under these circumstances a thrombus, and if the artery be a large one there may develop a secondary softening of the area of the brain over which it ramifies.

The syphilitic mental affections are sufficiently

important to call for special consideration; and the various psychoses included by the luetic attack are much in evidence in cases in which the paralysis, headache, epilepsy, and other manifestations point to the existence of gross cerebral structural alterations. Regarding the existence or non-existence of syphilitic insanity, that is, of insanity produced by specific contagion without the obvious presence of gummatous disease of the meninges of the brain authorities are at variance, only a few alienists recognising the existence of a distinct affection entitled to be called syphilitic insanity, and others denying that insanity is ever directly indiced by this disease. It is certain that insanity often occurs in the syphilitic, but syphilis is abundantly joined with alcoholism, poverty, mental distress, physical ruin, and various depressing emotions and conditions which are well known to be active causes of mental disorder. It is probable that syphilis is in such way an indirect cause of an insanity, which under circumstances could be properly termed specific. Allowing that there be disease of the cortex of the brain directly occasioned by syphilis, obviously such disease must give rise to mental affections; and if the lesion be so situated as to affect the psychic and avoid the motor regions of the brain, it will give rise to mental disorder without paralysis, that is, an insanity; again, if such cerebral disease be wisespread, involving the whole cortex, it will cause a progressive mental disorder, accompanied by gradual loss of power in all parts of the body, and ending in dementia with general paralysis; or, in other words, it will produce an affection more or less closely resembling the so-called general paralysis of the insane or paralytic dementia. A syphilitic individual may be troubled with an affection which is not directly due to the existing syphilis; therefore, when a syphilitic has any disorder there is only one positive way of determining during life how far this disorder is specific, namely, by the therapeutic test. In deciding whether a post-mortem lesion is specific or not, such a test is obviously inapplicable. The coexistence of syphilitic lesions elsewhere in the body will decide the mooted point, or at least renders highly probable the existence of the taint in the etiological sense. There are numerous cases on record in which a cerebral sclerotic affection coincided with a gummatous disease of the membrane. Gros (Syphilitic Nervous Affections, 1861,p.245) mentions a case having a clear syphilitic history in which the dura mater was adherent to the skull. The pia mater was not adherent. Beneath, upon the vault of the brain, was a gelatinous exudation. The upper cerebral substance was indurated, and pronounced by the examining histologist to be sclerosed. There were atheromatous arteries and spots of distinct softening at the base of the brain. Brown (Jour.Ment. Sci.,July,1875,p.271) describes a case in which the symptoms were melancholia, excessive irritability, violent outbursts of temper, very positive delusions, disordered gait, ending in dementia. At the post-

mortem examination, which was very exhaustive, extensive syphilitic disease of the vessels of the brain and spinal

cord were found. The pia mater was not adherent to the brain. The convolutions, particularly of the frontal and parietal lobes, were atrophied, with very wide sulci filled with the serum of the blood. The neuroglia of these convolutions was much increased, and appeared to be more molecular than normal, the cells were in a condition of degeneration, and in many places had vanished, their places being only occupied by some granular material. The frontal convolutions showed these changes most markedly. Schule (Allg.Zeit.f.Psychiatrie,xxviii.,171, 172) describes an interesting case in which the symptoms during life exactly simulated those of paralytic dementia. The affection commenced with an entire change in the disposition of the patient; from being taciturn, quiet, and very parsimonious, he became very excited, restless, and desiring continually to purchase in shops. Then failure of memory, marked sense of well-being, carelessness and indifference for the future, developed at the same time as failure of the power of walking, trembling of the hands, inequality of the pupils, and hesitating speech. There was next a period of melancholy, which was in time followed by continuous failure of mental and motor powers, and very pronounced delirium of grandeur, ending in complete dementia. Death finally occurred from universal paralysis, with progressive increase of the motor symptoms. At the autopsy characteristic syphilitic lesions were found in the skull, dura mater, larynx, liver, intestines, and testicles. They presented all the appearances of sclerosis and atrophy; the neuroglia was much increased, full of numerous nuclei, the ganglion cells destroyed. The vessels were much diseased, some reduced to cords; their walls were greatly thickened, and full of long spindle-shaped cells, sometimes also containing granules of fat. Stedman and Edes (Am.Jour.Med.Sci.,lxix,433) tell of a case in which the symptoms were failure of health, ptosis, trigeminal palsy with pain, - anaesthesia dolorosa, - finally mental failure with loss of power of motion and sensation. At the autopsy the following conditions were found: The apex of the temporal lobe was adherent to the dura mater and softened; there was exuded lymph in the neighbourhood of the optic chiasm; a marked increase of the neuroglia indicated a sclerosis of the right Gasserian ganglion; and the arteries at the base of the brain were in a state of degeneration. All the cases suffice to show that sclerosis of the cerebral substance not only coexist with a brain lesion which is certainly specific in its character, but also may present the appearance of having developed pari passu with that lesion and from the same cause. We have elsewhere seen that cerebral meningeal syphilis may coexist with various forms of insanity. It is, of course, probable that in some of the recorded cases there has been that double lesion of membrane and gray brain substance which has just been demonstrated by the reports of autopsies; but if we find that there is a syphilitic insanity, which exists without evidences of meningeal syphilis, and is capable of being cured by antisyphilitic treatment, such insanity must be considered as representing the disease of the gray matter of the brain. The recorded cases are so numerous that a

volume or more might easily be filled with their narration; but those I shall now narrate are amply sufficient to prove the point at issue, namely, that there is a syphilitic insanity which exists without obvious meningeal disease, and is capable of being cured by mercury or iodide of potassium. Streisand (Inaug.Diss., Berlin, 1878) tells of a case of epilepsy , of exaltation, with alteration of speech, headache, and failure of memory, which was rapidly cured by the exhibition of mercury; he cured another patient (ibid) in whom the symptoms were delusions, delirium, general mania, and great muscular weakness. Müller (Jour.Ment. Dis.,1873-74,561) cured by the administration of iodide of potassium a patient in whom the symptoms were those resembling general paralysis, and ultimately a sternal node. Esmarch and Jersen (Allg.Zeit.f.Physc.) report a case presenting such symptoms as sleeplessness, great excitement, restlessness, great activity, incoherence, and violence,-a cure being effected by mercury. Iodide of potassium cured one of Leidesdorf's cases in which the clinical phenomena was complete mania, playing with excrement, and total irrationality of conduct (Med.Jahr., xx.,1864,1). A similar therapeutic success is reported by Beauregard (Gaz.Hebd.de Sci.Méd. de Bordeaux, 1880, p.64), his patient developing symptoms resembling those of general paralysis. Rendu (ibid) describes a case with such symptoms as loss of memory, headache, irregularity of pupils, ambitious delirium, periods of excitement, others of depression, embarrassment of speech, access of furious delirium, ending in stupour - mercury ultimately effecting a cure. Rendu (loc. cit.,p.64) refers to another case of mercurial cure, in which the symptoms were hypochondria, irregularity of pupils, headache, failure of memory, melancholy, and stupour. Erlenmeyer (On Luetic Psychoses, 1877) was brilliantly successful in a case characterised by melancholia with hypochondriasis, insomnia, fear of mankind, and belief that the whole world was against him. He had the same therapeutic experience in a case of religious melancholia, with two attempts at suicide, ending in mania. The iodide of potassium was equally curative in a case characterised at times by very violent yelling, shrieking, attacks on everybody and everything, and at times erotomania; this woman was of bad habits, and presented ozaena and other physical syphilitic signs. He once cured a case with mercurial inunction in whom there was an epileptic attack followed by a long soporific condition, ending in mental confusion, failure to recognise friends, and an approximation of dementia. The same author describes a case characterised by great fear of policemen and soldiers, mania and hallucinations, loud crying, yelling, etc., subsequently-occurring convulsions being followed by great difficulty of speech; the cure was effected by mercurial inunctions combined with the internal exhibition of iodide of potassium, but ultimately there was a return of the convulsions, followed by hemiplegia and death. Another of his patients had great unnatural vivacity and loquacity, wanted to buy everything he saw, boasted of his enormous winnings at play, and has some trouble of speech; cure was effected by the iodide, and

the patient returned to business again, but ultimately relapsed. This occurred fifteen months after his discharge from the asylum; the symptoms developed very rapidly, and consisted of delirium of grandeur of the most aggravated type, with marked progressive dementia, failure of power of speech, and finally of locomotion; antisyphilitic remedies were of no use and the patient died. A. Erlenmeyer (loc. cit.) tells us of some other cases. In one of them there was failure of mental powers, inequality of pupils, trembling of the lip when speaking, uncertainty of gait, almost entire loss of memory, and once temporary ptosis and strabismus; iodide in ascending doses failed, though the patient recovered under mercurial inunctions. His second case was characterised by failure of mental powers, pronounced delirium of grandeur, hallucinations of hearing, failure of memory, and strabismus and ptosis of late occurrence; iodide of potassium and injections of corrosive sublimate effected a perfect cure. The third case was one of loss of memory and failure of mental powers, slight ideas of grandeur, disturbance of sensibility and motility, and aphasia of late development; iodide and mercurial inunctions brought about a cure. The fourth case was one of melancholia, with great excitability and ideas of grandeur, and strabismus and ptosis of very late appearance; iodide of potassium failed, mercurial course improved, and joint use cured. The fifth case presented such symptoms as various cerebral nerve palsies; the use of mercurial inunctions gave great relief; but subsequently there was observed the development of great excitement, delirium of grandeur, failure of memory and mental powers, and finally death from apoplexy; no autopsy. Chapin (Am.Jour.Insan.,Vol.xv.,p.249) says that the iodide cured one of his cases in which melancholia, suicidal attempts, epilepsy, headache, and somnolent spells were prominent features. A cure was effected by this drug in another case of melancholia, acute mania, noisy and very destructive attacks, syphilitic disease of the tibia being also observed. Snell once successfully treated a case of maniacal excitement with anti-syphilitic drugs. Smith (Brit. Med.Jour., July, 1868,p.30) reports a case of apathetic melancholy, indelicacy, monosyllabic speech, spells of dumbness, sullenness and threatening; the patient was rapidly cured by the conjoint use of the iodide and mercurials; the symptoms had apparently developed three months after the appearance of the chancre. I have given this brief summary of recorded cases to show that cerebral syphilis may find expression in any form of mania, and that, however various they may be at first, the symptoms, unless relieved, almost invariably end in dementia. Of all forms of insanity, general paralysis is most closely and frequently simulated by syphilitic cerebral disease. The exact relation of the diathesis to true, incurable, general paralysis is very difficult to determine. It seems certain that amongst individuals suffering from this disorder the proportion of syphilitics is not only much larger than normal, but also much larger than in other forms of insanity. Thus, Mendel (Progr.Paral.der Irren, Berlin,1880) found that in one hundred and forty-

six cases of general paralysis, one hundred and nine, or seventy-five per cent., had a distinct history of syphilis, whilst in one hundred and one cases of various other forms of primary insanity only eighteen per cent. had syphilitic antecedents. Obersteiner (Monats.f. Prakt.Derm.,Dec.,1882) had amongst a thousand cases of mental disease one hundred and seventy-five cases of paralytic dementia; of these twenty-one per cent. had syphilis; moreover, of all his syphilitic patients fifty-one per cent had paralytic dementia. He sees a relationship to the other lesions of syphilis in the inflammatory process which is present in progressive paralysis and which runs a slow course, attacking the pia mater and cerebral cortex, and finally leading to sclerosis with atrophy. Arguing from this pathological similiarity he places dementia among the later forms of syphilis. Hirschl, after a very interesting analysis of the factors which come under consideration here, reaches the conclusion that this paralysis is to be looked upon as one of the later forms of syphilis, as an ancephalitis syphilitica, the issue of which is in syphilitic cerebral atrophy. The opinion of authors as to the manner in which syphilis is related to dementia paralytica still diverge, it is true, but most of them agree that these relations are certainly present in a very high degree. Those who suffer from syphilis are exposed in a much greater proportion than are other persons to the ill effects of intemperance, sexual excesses, poverty, mental agony, and other well-established causes of general paralysis. It may be that this is sufficient explanation of the frequency of general paralysis in syphilitics, though I am inclined to believe that syphilis has some direct effect in producing the disease. Be this as it may, there seems a full measure of truth in the opinion of Voisin (General Paralysis of the Insane,1879), that there is a syphilitic periencephalitis, which presents symptoms closely resembling those of general paralysis. Fournier (Brain Syphilis,Paris,1879) is firmly convinced of the relation of the two diseases, and includes general paralysis amongst the parasyphilitic affections. The most prominent symptoms are loss of memory and intelligence, together with increased irritability frequently alternating with apathy; immobility of the pupils and disturbance of speech are very characteristic of the disease. Paralysis, originating in the spinal cord, is very seldom absent. Frequently, with or without loss of consciousness, a hemiplegic, monoplegic, or aphasic attack comes on - the paralytic attack; the paralysis sometimes rapidly disappears, again sometimes it persists for hours or days. Aside from these apoplectiform attacks, epileptiform attacks are not infrequent. Although occasionally quite notable remissions occur, improvement is never long continued, and the progressive course of the disease leads inevitably to permanent paralysis and total idiocy, and ends, as incurable cerebral disease in general, after a few years, - in rare cases even after a few weeks, in death. Dementia occurs most frequently in individuals between thirty and forty years of age, and then four or five years after syphilis has been acquired. Cases have, however, also been reported in which infection had taken

place only two years previously, and other in which the disease occurred as long as twenty years after the infecting contact. The diagnosis of these cases from true incurable paresis is of great importance, and the points which may be relied upon for the recognition of the syphilitic affection are the occurrence of headache, worse at night and present amongst the prodromes; an early persistent insomnia or somnolence; early epileptiform attacks; the exaltation being less marked, less persistent, and perhaps less associated with maniacal restlessness and excitement; the articulation being paralytic rather than paretic; the absence of tremulousness, especially of the upper lip; and the response to the therapeutic test. Under these circumstances the affection is in all probability syphilitic and remediable. But the absence of these marks of specific disease is not proof that the patient is not suffering from syphilis. Headache may be absent in cerebral syphilis, as also may insomnia and somnolence. Epileptiforms attacks are not always present in the syphilitic paralysis, and may be present in the genuine affection; a review of the above cases shows that in several of them the megalomania was most pronounced; and other cases with very pronounced delirium of grandeur, in which the autopsy revealed unquestionably syphilitic cerebral lesions have from time to time been reported. One sometimes comes across cases in practice in which symptoms of general paralysis occurred in individuals with a specific history, the therapeutic test being the only means of effecting the recognition of the true nature of the disease.

SPINAL CORD.

Most of the cases of spinal syphilis eventually show signs of extension to the brain, and on this account the early diagnosis of the former condition becomes of prime importance. There are not many cases in the literature with full autopsical findings; and in the clinical observations of recovered cases the exact nature of the lesion seemed a matter of no inconsiderable doubt. Furthermore, there is scarcely any chronic degeneration of the spinal cord which has not been attributed to syphilis, though syphilitic persons undoubtedly show spinal lesions more often than others. Syphilitics not infrequently suffer from acute or subacute myelitis. Dejerine (Rev.de Méd., Jan.,1884) tells of the case of an individual who suffered from chronic syphilis, in whom there were lightning pain with increasing weakness of the legs, and subsequently, after very sevère exposure to the weather, a sudden development of complete paraplegia followed by trophic troubles, and death in twenty-eight days. At the autopsy there was found a central myelitis with pronounced lesion of the ganglionic cells, inflammatory changes of the pia mater, capillaries, and neuroglia, extreme alteration of the nerve-roots, and secondary degeneration of the columns of Gall and the lateral columns. In a second case recorded by the same author, there appears to have been no exposure or apparent immediate exciting cause. The symptoms and lesions were similar to those just

mentioned, but death carried off the patient a few weeks afterwards. There has been considerable disputation in the past as to whether or not such attacks as those occurring in syphilitic individuals are produced directly by the specific affection. The same is true of subacute myelitis, and the general symptoms of which are progressive loss of power with grossly exaggerated reflexes, severe twitchings and jerkings of the legs, rigidity, usually more or less marked pain, and other sensory disturbances in the legs, and finally partial anaesthesia and complete paraplegia, paralysis of the bladder, bed-sores, and death from exhaustion. At the autopsy the most important change in the spinal cord is the presence of great numbers of round neuroglia cells in both gray and white matter. Some of the reported cases have died of a rapidly developing central myelitis supervening upon the subacute disease, and affording lesions similar to those described by Dejerine in addition to the changes of the subacute disease. In other syphilitic spinal cases the symptoms resembled those of the so-called acute ascending paralysis of Landry. The fourth variety of syphilitic disease of the spinal cord of Huebner (loc. cit.) includes these cases. According to that author, they were without anatomical lesions, but in the majority of the recorded cases no proper microscopical study of the spinal cord was made. He states, however, that Kussmaul failed in one case after much study to detect lesions. As some of these cases may really have been instances of peripheral neuritis, it is essential that the peripheral nerves as well as the spinal cord should be submitted to histological examination. It seems uncertain whether or not these acute cases should be attributed to syphilis; for in not a few of them a score of years may have elapsed since the chancre, alcohol has been used to excess, and the attack was apparently precipitated by great exposure. On the other hand the patients tolerated huge doses of the iodine and gradually improved. There is a class of disease of the spinal cord in which the lesion is undoubtedly directly due to syphilis. In these cases the exudation commences primarily in membranes of the cord, and may extend into the cord itself. In this class the first two varieties of syphilitic spinal disease of Huebner may be included. The lesions in these cases closely resemble those of the cerebral syphilis. The affection very seldom, or never, begins in the interior of the cord; Wagner's case, in which a yellow nodule was found within the cervical marrow, was probably not one of syphilis. If a gummatous inflammation does occur inside of the cord, it probably starts from the ependyma. The gummatous exudate may occur in the form of small multiple formations or of extensive meningitis, with an infiltration of the membranes and of their spaces with gummatous material. The membranes are usually agglutinated with one another, and with the surface and with the cord. The exudation is usually composed of roundish cells, and in several cases spindle-shaped cells have been found, as also the peculiar Deitres corpuscles already described as they occur in syphilis of the brain. The changes in the cord itself vary somewhat. In Winge's case the white matter

seems to have undergone a rapid myelitis from pressure. It was of a grayish colour, with numerous fine granular masses, corpora amylacea, pigment masses, and fatty globules, the nerve fibres being broken up. In other cases the change has been a sclerosis. The vessels of the cord have been noticed by various observers in the different stages of the degeneration seen in syphilis of the brain. They were often greatly dilated, their walls thickened, and together with the lymph spaces, infiltrated with small cells. Sometimes tiny bleedings occur. What Huebner calls syphilitic callus is probably the remnant of a true gummatous inflammation. It consists of a circumscribed induration one to several lines in thickness, originating apparently from the dura mater, and causing sometimes adherence with the vertebrae, in others with the membranes of the spinal cord. In a case described by Virchow of this character the lesion was cervical, and the symptoms were stiffness in the nape of the neck, pains in the neck and arms, and finally paralysis in both arms. The clinical phenomena induced mainly arise from the implication of the roots of the nerves, as the lesion of gummatous spinal syphilis affects primarily the membranes of the cord. Obviously these symptoms vary with the seat of the lesion, for it must be borne in mind that the meningeal irritation is at first usually localised in a small area. As in the majority of cases this lesion affects a posterior portion of the cord, and as the posterior nerve roots seem especially sensitive to irritations of this character, pain is generally a marked and early symptom of spinal syphilis. The seat of the pain varies with the seat of the lesion. At first the pain is slight, but in most cases it soon becomes severe. It is sometimes situated at a fixed spot on the spinal column, where it may be increased on pressure. Several such cases have been reported, the patient suffering not simply from a spinal syphilis, but also from an implication of the vertebral periosteum or of the vertebrae themselves. When the lesion is purely meningeal, there is probably no marked local tenderness. The severe pains usually felt in the extremities or in the trunk are often fulgurant; sometimes they are described as resembling the thrust of a knife, and not rarely they closely resemble the pains of tabes dorsalis. In some instances the pains are comparatively slight; and are aching in character. Paraesthesiae are not rare phenomena: such are formications, tingling in the extremities, numbness and feeling as though the limb were asleep, intense sense of coldness on the surface, sensation of water running over the limb. Early in the disorder there is sometimes very marked hyperaesthesia, but later, even though the pain persists, blunting of sensibility is marked, and there may be complete anaesthesia. The latter is sometimes localised in certain parts of the limb. Thus, in a case reported by Mathieu (Ann. de Derm et Syph.,Vol.iii., 1882), although there was complete anaesthesia of the outer side of the left leg and foot, the inner side retained its normal sensibility. In some cases there is the abdominal concture of ordinary myelitis. The

records show that even in these early stages there may be diplopia, amblyopia, or other visual affections, and the pupil may be distinctly affected. In these cases the upper portion of the spinal cord is very likely the part involved. Though sometimes of early occurrence, it is usually some time after sensation has been affected that disturbances of motility occur. Generally, the first symptoms are those of irritation ,such as rigidity of the neck, back, and limbs or even of isolated groups of muscles. Tremors have been described as frequently present. These may be convulsive, and are often plainly reflex in their origin; indeed, it would seem that they are always reflex tremblings, and never true tremors. Cases have been recorded in which a paralysed limb was thrown into violent tremblings whenever passive movement was attempted. The patellar reflex is usually grossly exaggerated, although it may be lost in the later stages of the disease. Not infrequently there is the condition which has received the name of spinal epilepsy. This exaggeration of the reflexes may be limited to a leg, when it is almost pathognomonic. In some cases severe cramps are excited by movement. Usually there is no tenderness. These symptoms of the meningitic stage may continue for weeks or months without there being pronounced paralysis, although locomotion is not rarely interfered with by the stiffness of the legs. Finally, if the case progresses the patient notices a weakness in one or both legs, or, - if the disease be situated high up the spinal cord, - in one arm, which rapidly increases until there is almost complete loss of power. This rapid increase of palsy following long-continued disturbance of sensation is almost pathognomonic. In most cases one side of the body is more affected than the other. The sphincters are apt to be implicated, and in advanced stages of the disease there is generally complete loss of control over the bladder and rectum. The patient may live for months without very distinct change of this condition, or bedsores or other trophic disturbances may rapidly develop and death ensue in a short time. One may see under these circumstances marked elevation of the temperature, rapid feeble pulse, mental weakness, and the general symptoms of septicaemia last for many weeks. Ammoniacal cystitis is obviously prone to be developed during this stage. When motility fails, sensibility is usually blunted, although the pains may increase. One of the characteristics of the disease is said by some to be an incompleteness of the anaesthesia. There may be variations observed from this typical course of spinal syphilis. Sometimes the power of co-ordination is early affected, and the symptoms may resemble those of locomotor ataxia. One may doubt, however, whether under any circumstances there is a loss of the patellar reflex in the early stages of the gummatous disease of the spinal cord. In other cases the paralytic symptoms may be very prominent from the beginning. Eisenlohr (Neurol. Centralbl.,1884,p.73) draws attention to the difficulty sometimes encountered in diagnosing spinal syphilis and cites an illustrative case. The first symptom was obstinate constipation, with

a very great discomfort after defaecation; then appeared incontinence of urine with weakness of the legs; finally, a sudden complete palsy of the right leg occurred, with marked anaesthesia in both legs, partial loss of power in the left leg, violent boring abdominal pains, and distress in the bladder. In the last stages there were severe neuralgic pains in both legs, with complete loss of sensation, bed-sores, atrophy of the leg muscles, with reactions of degeneration, and death from exhaustion. At the autopsy an advanced meningitis was found which had apparently commenced in the region of the cauda equina, and given rise to complete degeneration of the nerves. An ascending degeneration of the posterior columns was the only lesion discovered in the spinal cord. It may also be noted that, owing to the diseased condition of the vessels, a spinal syphilis may be suddenly interrupted by an attack of apoplexy. In a case of gummatous spinal syphilis it not rarely happens that there is an abrupt development of violent tearing pains, loss of power and sensibility, and all the other symptoms which are characteristic of meningeal spinal haemorrhage. Weber (Am.Jour.Neur. & Psych.,Vol.ii) tells of a case in which, after doubtful premonitory symptoms, such as vertigo, loss of power on the right side, pressure in the top of the head, and tinnitus aurium, there was a sudden development of convulsions, and death. An autopsy was performed, at which the findings were a recent thrombosis of the basilar artery and a gummatous tumour of the vertebral artery on the right side.

Some reference may here be made to what is generally termed PARASYPHILIS, a full account of the lesions of whichm usually appearing in the so-called QUARTERNARY (late tertiary) STAGE are graphically described by Fournier (Les Affections Parasyphilitiques,1903). The parasyphilitic affections are those conditions which follow, or are believed to follow syphilis, although they are obstinate to specific medication. These disorders occur long after the chancre, and in not a few cases the syphilitic attack of long ago was notably benign and uneventful. These parasyphilitic diseases, in addition to giving no response to mercury or iodide of potassium, are peculiar in the fact that they differ in no way from the same lesions when arising independent of a syphilitic cause. The principal parasyphilitic affections are tabes dorsalis and paralytic dementia, which have already been referred to above, which seem to be attributable to toxic or chemical properties secondary to the active infection. Other complications of this class are neuralgia, hysteria, and neurasthenia, which do not differ from the non-specific affections and need not therefore be individually described. Fournier (loc. cit,) holds, but without confirmation by others, that, in addition to the epileptoid expressions of cortical invasion, there is a form of epilepsy which is peculiarly syphilitic, whose characteristics are absence of other signs of brain disorder, regular and unchanged course, a long or lifetime duration, and indifference to the exhibition of the bromides. Finally, parasyphilis may

attack tongue, especially in those addicted to the tobacco habit, and give rise to lesions presenting a marked resemblance to cancer, or even degenerate into it; various forms of syphilodermata are occasionally observed, as are amyloid degeneration, arteriosclerosis, aneurysm, and diabetes insipidus.

HEREDITARY SYPHILIS.

SKIN.

Hereditary finds expression in lesions of the skin which present a remarkable resemblance to those of the acquired disease. But the extreme delicacy of the infant's general integument causes them to undergo certain modifications. Thus, there is a marked tendency for the development of mucous patches of ordinary erythematous or papular syphilodermata under the influence of heat, dirt, and other obvious irritations; these complications are particularly to be observed about the folds of the neck, the armpits, the inguinal region, the buttocks, the anus, and the angles of the mouth and nose. This applies to the acquired disease in young persons. In congenital cases there are important peculiarities observed, and the cutaneous lesions are usually the first thing attracting attention to the existence of the disease. These syphilides may be present at birth or be noted later on in the course of the malady, the period of maximum prevalence being the first three months of the subject's mundane existence. A syphilitic foetus aborted as early as the seventh month may manifest skin disease, in the form of livid and other discolorations, and softened and macerated skin. Tainted children born alive and at term not infrequently display the peculiar skin troubles of this disease; more usually the skin appears to be healthy, an appearance, however, which seldom continues after the first month, the lesions following closely after the peculiar snuffling that generally ushers in the symptoms; and accompanying the more or less rapid developing cachexia; for, although at birth these infants often present the appearances of perfect health, with the evolution of their phenomena this cachexia will almost certainly be observed, and will give the patient a strange and almost pathognomonic aged appearance. There are various forms of cutaneous lesions in this disease, and they may develop simultaneously or in succession. A rather common hereditary syphiloderm is the bullous syphilide; it is a serious affection and not infrequently seen under the skin of the infant at its birth. It has received the misnomer of syphilitic pemphigus. It may commence its evolution as early as the sixth or seventh month of intrauterine life, and only exceptionally makes its appearance later than the tenth

or twelfth day after delivery. Its favourite sites are the palms and hands, extending often to the legs and forearms, but not infrequently invading the head and trunk. It is symmetrical, marks an extreme degree of syphilitic infection, and is of very grave import. The blebs develop irregularly, and commence as small areas of dusky and violaceous infiltration, which after a day or two become surrounded by one or small vesicles, or, rarely, pustules. These gradually enlarge to form after a few days pea-sized to bean-or even egg-sized blebs. The blebs sometimes have irregular margins from coalescence, and are seated upon dull-red surfaces. At first serous, their contents become turbid and finally purulent or even sanguinolent. By degrees their walls become flaccid and collapse, or are ruptured and form more or less extensive crusts of dirty-brownish or even blackish colour. More often they are stripped off by friction or by the discharge, and expose livind secreting surfaces, which may ulcerate or become covered with false membrance or gangrenous. In favourable cases a healthy skin is developed in their place. The evolution of these lesions accompanies a rapidly developing cachexia, and death not rarely supervenes after a few days. When antisyphilitic medication is effective, new lesions cease to make their appearance and old ones gradually heal, leaving behind a coppery or violaceous, very persistent pigmentation. In severe cases blebs form upon the general surface. A bullous eruption, however, which first appears after the second week after birth will probably prove not to be syphilitic. After the third month the bullous syphilide is seldom seen, relapses occurring with great rarity. In non-syphilitic bullous eruptions in infants the palms and soles are not often invaded, but rather the trunk and limbs. The blebs are larger, the liquid contents clearer, their bases deeply coloured; desiccation is more rapid, and, for a long time at least, there is a notable absence of cachexia. Some exceptions are, however, observed. Cases have been recorded of a general syphilitic bullous eruption present at birth, not involving the palms and soles, where the epidermic was fine, smooth, shining, but free from skin disease. The erythematous or roseolous syphilide is by some considered not of very common occurrence; in the sense of a roseola it is not often observed. But that of congenital syphilis is seldom essentially of this type. It generally begins as discoid or oval, unelevated spots about the size of a finger nail, of a pale-red colour which fade on pressure. The spots are occasionally livind or violaceous. They first appear upon the lower portion of the abdomen, quickly extending to the extremities and head. They often coalesce to form extensive areas, encircling the neck, for example, like a necklace. These areas may or may not be covered with a thin branny disquamation. They are especially noticeable on the face, where, as they slowly fade from the cheeks, forehead, and chin they no longer disappear on pressure, and come to acquire a characteristic muddy or coffee-and-milk appearance. Scattered irregularly and occupying continuous areas of the integument, the pale-red colour early yielding to the dull-yellowish or coppery staining, this eruption

is extremely common, and constitutes the macular syphilide of congenital syphilis. When situated upon parts of the body exposed to irritation, the erythematous patches sometimes becomes fissured and crusted, or may even be converted into mucous patches; or, after some weeks, they may become infiltrated and gradually changed into flattened papular lesions. Erythema of the palms and soles is very characteristic. The skin of the parts is reddened and wrinkled, and covered with a thin disquamation, often in flakes of large size. The eruption in such situations would seem to indicate a tendency towards the more severe bullous syphilide or so-called syphilitic pemphigus as here not infrequently observed. The lesion is one of the earliest expression of the constitutional disease. It may be present at birth, when, on account of the bright-red coloration of the general integument, it may escape notice. It is seldom seen after the third month of life; its very late appearance would indicate that the infant was not infected before birth, but either during delivery or after that event. The hyperaemia is not infrequently evanescent, and the characteristic pigmentation following it may be of long duration. All sorts of local irritations may cause a simulating and non-specific erythematous eruption to appear upon the buttocks, groins, and other parts of syphilitic infants. The vast majority of syphilitic infants early exhibit the papular syphilide, which may be present on them at birth, by itself or with other lesions, or it may, and generally does, make its appearance during the first few weeks of life; or it may first develop rather later than the syphiloderm just described. It is generally scattered over a wide area as the lenticular papule, grouped miliary papules being much less common. They are discrete, and seldom exceed the size of a hemp-seed. Occasionally only a few scattered lesions can be found. Their colour is often pale-red; generally-however, they rapidly acquire the brownish-red or coppery hue characteristic of syphilitic eruptions. The papules are distributed over the trunk and extremities with more or less symmetry, and like the eruptions in acquired syphilis seldom give rise to itching. After a while they often become surrounded with thin scales, This is especially the case upon the palms and soles, where they are broader and flatter, and there they may coalesce into irregular patches with desquamation of thin branny flakes. Where folds of skin are in contact or when the lesions are kept moist by wet napkins, etc., the papules exfoliate their more superficial layers of epidermis, and f equently become converted into mucous patches, the differences of the lesions being due to location and environment, and not to any essential dissimilarity. Such patches may be observed about the mouth and nares, the anus, the perineum, and the external genital organs. About the mouth and nares these lesions often become deeply diffused, involving destruction of connective tissue. In afterlife the linear cicatrices remaining after the healing of these become prominent witnesses to the presence of the inherited disease. In the absence of treatment and of cleanliness, these mucous patches may undergo great development,

coalesce, and form elevated surfaces, or condylomata lata, of smooth grayish appearance, emitting a stinking discharge. Under treatment the syphilitic papule and condyloma disappear with more or less rapidity, leaving a coppery pigmentation which may last for months. It is important in the case of infants more than six months old not to mistake the papular syphilide, when of rose-red and pale colour, with simple papular eczema, from which it can be distinguished by associated syphilitic symptoms, its more discrete character, and the fact of little or no itching. The vesicular syphilide appears in the form of small discrete blebs, and is generally associated with the papular and papulopustular lesions. When the individual vesicles are large, their contents soon become purulent. The small vesicles are grouped, and are placed on indurated papules. The eruption is seldom observed and points to the existence of a severe infection. The pustular syphilides generally succeed the papular eruption, though they may be noted at birth or may develop as the first symptoms. Not infrequently they do not develop until several years after the first outbreak of skin trouble. The pustules vary in size, number, and depth according to the severity of the constitutional disease. They are most often seen on the buttocks, thighs, scalp, face, and soles; in the opinion of some, late tertiary lesions will probably occur. Just as in the case of the adult, the pustular eruption may take the form of acne, impetigo, or ecthyma. Syphilitic impetigo is most common on the face and scalp. The axillary and inguinal regions are also favourite sites for the lesion. Distinct, often deep, ulceration beneath the crusts, and coppery infiltration of the periphery of the lesion, differentiate the syphilitic affection from simple impetigo. Syphilitic ecthyma attacks the buttocks and thighs by preference, forming large, flat, infiltrated pustules, the thick crusts of which conceal ulcers of some depth. Permanent scars remain in the case of these pustular lesions; enormous destruction of the skin may be the outcome of complications with cellulitis and gangrene. All the above-mentioned syphilides occur in the earliest days of the infant's existence, and they are often present all together. The erythematous or macular and the papular eruptions are the most common; the vesicular eruption is rare and limited in amount. Concurrently with the eruptions the infant usually shows unmistakable evidences of the progress of the disease, in the development of those other symptoms which belong to the congenital disease; or yielding to the influence of treatment, the integumentary troubles gradually disappear as the general health of the patient improves. They may never appear again; but more usually, however, relapses are seen. During the first two years these consist mainly of erythematous or papular eruptions. In cases of weak infection the early symptoms may be so insignificant as to attract but little attention, and a period of quiescence ensue which may extend into or beyond the second dentition; or the frequently recurring manifestations may commence to present characters very like those of the tertiary stage of the constitutional

disease. When these occur, seldom or never are the above-described precocious phenomena observed.

The tubercular, gummatous, or ulcerative syphilodermata may be seen as early as the sixth month, indeed, at any age; but most usually make their appearance from the tenth to the thirtieth year. They may assume the dry or ulcerative form, and generally show a circular or circinate grouping. Usually but one group is observed. The favourite sites of the lesion are the face, particularly the nose, and the anterior aspect of the leg. They appear in the form of painless, slowly increasing, ham-red infiltrations, which generally ulcerate and are covered with thick crusts. These ulcers may heal, or may slowly extend, forming phagedenic or serpiginous lesions. Infiltrations which do not proceed to ulceration are absorbed, leaving atrophic areas; the ulcerating lesions leave deforming scars: hence the importance of early recognition and prompt treatment of these syphilides. When the face is attacked they bear a marked resemblance to lupus. The dusky-red colour of the syphilide and the firm induration are the main differential points of use in distinguishing between the dry tubercular syphiloderm and non-ulcerating lupus. Tubercular nodules show a more translucent, yellowish-red, and are more yielding to pressure. Fournier regards the areola, the crusts, the borders of the lesion, the base of the ulcer, and the configuration of the lesion as the cardinal points in the differential diagnosis between ulcerating syphilides and lupus. The areola of the syphiloderm is dusky-red, that of the lupus lesion is lighter and sometimes of bluish hue. The crusts of the syphilides are more homogeneous, more compact, thicker, and harder than those of the scrofulides. They are more often stratified and more deeply coloured, almost black or greenish-black. In syphilides the borders of the lesion are always sharply defined, elevated, infiltrated, punched out, and adherent. In lupus they are less distinctly outlined, are flat, soft, often reduced to a simple ulcerating circumference. They are not punched out, and are not infrequently loose and undermined. In tertiary syphilis the base of the ulcer is deep, irregular, anfractuous, and shows a yellowish, adherent, semisolid covering, representing the necrosed gummatous infiltrate. Lupus shows ulceration more on a level with the surrounding surface, with cherry-red granulations, sometimes exuberant, sometimes presenting a smooth and glistening surface. Regarding the configuration of the lesion, often, but not invariably the syphilitic lesions form a complete circle, a portion of a circle, or serpentine undulations. There is more irregularity about the ulcerations of lupus. In addition to these minor points of difference, it is necessary to observe the method of evolution, the previous history, etc., and to make note of the general circumstances of the case.

HAIR AND NAILS.

Congenital syphilitic cases not frequently show affections of these appendages of the skin. A temporary

alopecia is by no means rarely encountered. It may be general or in patches, and differs in no respect from the alopecia of acquired syphilis. The hair grows again in due course. But the loss of hair which follows the pustular and ulcerative lesions of the scalp and depends upon destruction of the hair follicles is never recovered from, and permanent baldness remains. The nails are also not rarely implicated in the syphilitic processes flourishing on the skin. The lesions may be either dry or moist. The moist eruptions are generally pustular, and invade at first the fold of the nail. They may disappear without injury to the nail. Suppuration may, however, involve the matrix. During the progress of this syphilitic onychia the nail becomes raised from its bed, and is thrown off. The terminal phalanx of the finger becomes shaped like a club. The texture of the regenerated nail is spongy and brittle. Several successive nails may thus be exfoliated, and when the inflammatory action finally subsides the nail may remain permanently misshapen and abnormal. Several fingers and toes may be affected. In onychia associated with desquamative erythema of the hands the fold of the nail is reddened and swollen, and streaks and fissures are seen on this structure.

MUCOUS MEMBRANES.

The mucous membranes are commonly implicated in hereditary syphilis, and the affections observed are pretty much of the same kind as those seen in connection with the skin. Thus, patients with pemphigus usually show large or small raw surfaces upon the mucous membrane of the tongue and throat; papular and papulopustular lesions on the skin are accompanied by mucous patches in the mouth. Even the mucous membranes of nose and ear and larynx may be involved in addition to the mouth and pharynx. Indeed, syphilitic coryza is one of the most characteristic, and at the same time one of the most important, of the early symptoms of the disease, since by its interference with respiration it greatly hinders the proper nutrition and development of the infant. This condition of the nasal mucous membrane is shown by a thin, watery, irritating discharge, which dries in crusts about the nasal orifice; underneath these crusts are found excoriations and ulcers. The catarrhal swelling of the mucous membrane and the crusting produces so much narrowing of the air-passage that respiration is difficult and noisy, the latter symptom giving the well-known name of snuffles to the affection. Mucous patches, erosions, and ulcers form on the lips, particularly at the angles of the mouth, and on the tongue, the gums, the palate, and the pharynx. Caries and necrosis of the palate and of the nasal bones frequently complicate these ulcerations, and give rise to the condition known as syphilitic ozaena. Not rarely the larynx is invaded; the organ then shows the infiltrations, erosions, and ulcerations seen on the mucous surfaces, and the characteristic hoarse voice is produced. In rare instances infiltration narrows the air-way to the extent of producing great dyspnoea and sometimes the

death of the patient. Typical tertiary lesions make their appearance after many years or when the child has arrived at the age of puberty. These are similar to the like affections in the adult. They are characterised by deep infiltrations, which show a tendency to break down, forming ulcers, which are accompanied by few subjective symptoms. Their favourite seat is the palate, but they are not infrequently seen on the posterior pharyngeal wall, the anterior pillars of the fauces, and the hard palate. The mucous membrane of the nose is also affected, and the ulceration is very apt to extend to the underlying bone, producing great deformity or even complete destruction of the face. Perforation of the septum of the nose and of the hard palate is generally seen. The condition must be distinguished from lupus, which seldom attacks either the mucous membrane or the bones of the nasal passages, being rather sharply confined to the regions of the anterior nares. Syphilis does not present these characteristics. Laryngeal tertiary affections may give rise to great destruction of the cartilages; deforming or crippling contractures result, or the bronchial tubes may be invaded and a chronic inflammation result. These laryngeal syphilitic cases sometimes die from spasm or oedema of the glottis.

EYE.

Caries of neighbouring bones may give rise to an inflammation affecting the lachrymal apparatus. Some of the cases of hereditary syphilis show marginal blepharitis in the form of small irregular ulcers, usually near the corners. But interstitial keratitis is the most characteristic lesion of the congenital disease and of great interest and importance in general practice where it is commonly observed. It commences usually as a slight diffused haziness in the substance of the cornea itself, generally not far from the centre, and at first affecting only one eye. This depends at this stage on the presence of a number of distinct dots of inflammation, limited to circumscribed, almost microscopic areas, but later, in a few days, these coalesce, and at the end of a few weeks the whole cornea will have probably become nearly or quite opaque, looking like ground glass. There is no ulcerations, and but little congestion as compared with that seen in other inflammatory ocular affections, although in the majority of cases there is a fulness of the ciliary vessels and a little photophobia with pains around the orbit. This condition may persist for one or two months, after which the other cornea is nearly always attacked, and is similarly affected, although the disease is apt to pass through its different stages rather more rapidly than in the case of the eye first affected. At the acme of the malady the cornæ are nearly opaque, a bare conception of light remaining, so that the patient is just aware of the difference between its presence and absolute darkness. Then the cornea which was first involved begins to clear; this is soon followed by improvement in the other one, which in the course of a year or two results in fairly good sight, although in most cases there remains a haziness of slight character and an abnormal expansion of the cornea. This

favourable result is much influenced by the character of the case, which is sometimes very mild from the outset, and by the thoroughness of the treatment. It is sometimes complicated with iritis, keratoiritis, cyclitis, posterior choroiditis, secondary glaucoma, etc., in which case the prognosis is obviously most unfavourable. Even in ordinary cases it should be guarded in respect to perfect restoration of function, as clearing of the cornea may reveal adhesions from iritis or spots of choroiditis disseminata, which could not, of course, have been previously detected. In very mild cases, however, without much evidence of involvement of the other tunics, and which have submitted to treatment early, it is not rare to observe an almost perfect transparency of the cornea regained. The recognition of this affection may usually be effected without much difficulty. The ground-glass appearance in the earlier stages and dull-pink or salmon colour in the more vascular stage are very characteristic. The vascularity differs from that attending other forms of keratitis, granular lids, etc., in which the vessels are large and superficial, in that the syphilitic keratitis they are much deeper and very closely interwoven, so that the effect is almost that of an ecchymosis. In other cases both eyes are not so apt to be affected, nor is the tendency to spontaneous cure so marked. The absence of ulceration and the very slight degree of accompanying sclerotic or ciliary congestion are diagnostic points which should also be borne in mind. The lesions which are most likely to be mistaken for it are certain forms of inflammation following smallpox and very superficial ulcers in a healing stage, as well as cases of conjunctival vascularity. It may happen that there is difficulty in distinguishing it from a form of non-syphilitic relapsing cyclitis with corneal opacities and iritis. This, however, is a disease of adults, often limited to one eye, wuth a strong tendency to relapse, the opacities being more abruptly defined and limited to the region near the circumference of the organ. The diagnosis, however, will largely depend upon its association with other signs of the syphilitic taint. A large proportion of all cases of interstitial keratitis occur in patients between the ages of eight and fifteen, the disease being comparatively rare in early childhood, and still more so after adult age has been reached. It is seldom or never seen after the age of twenty-six. The patients present the physiognomical peculiarities of inherited syphilis. In more than half the cases the previous history, especially as regards infancy, is one of hereditary syphilis, and in not a few instances there is a clear history of infantile syphilis in brothers or sisters. The present or previous history of syphilis in one or both parents may be elicted. Perhaps some of the mothers have had abortions or miscarriages. The lesion is not infrequently associated with such undoubted syphilitic lesions as nodes, ulcerations of the palate, and so forth. Although opinions differ as to the relation between syphilis and this form of keratitis, - as to whether, for example, it is a symptom of syphilis itself or of a cachexia frequently produced by syphilis, but often by other systemic affections producing malnutri-

tion, - yet, on the whole it would seem that the weight of authority is chiefly on the side of a distinct and practically invariable relation of cause and effect between the congenital taint and the ocular lesion in question. In an article in Holmes' "System of Surgery," on ocular affections, Dixon would call the affection syphilitic keratitis, and says that it is encountered exclusively as a sequel of inherited taint. He goes on to remark that we may encounter "some syphilitic keratitis in patients with healthy physiognomy and deformed teeth, or, still more rarely, in those with faultless teeth and the syphilitic cast of features; but to find the true form of keratitis in connection with both good teeth and good complexion is, I think, next to impossible." Many other ophthalmologists express themselves to the same effect more or less strongly. Nettleship, Noyes (Text-Book of Ophthalmology), Foerster (Handb.der Gesam.Augenheilk.,Vol.vii.,p.186, 1876), Macnamara and Carter, and De Wecker (Ocular Therapeutics,1879) may be mentioned as having ranged themselves on this side. On the other hand we have such authorities as Schweiger (Handbook of Ophthalmology), Maunther (Zeissl's Handbook of Syphilis,1875,p.228), Saemisch (Handbook of Ocular Diseases,1875,Vol.iv.,p. 264), S. Wells (Diseases of the Eye), and others who are not convinced that syphilis is the sole or even, in the opinion of some, the principal excitant of this affection. The conclusions of Jullien (op. cit.,p.1013) most nearly express the views of those who do not accept the syphilitic theory of the affection in its entirety. He holds that the interstitial keratitis coincides frequently, but not invariably, with syphilitic derangement of the dental apparatus; that it is associated with a feeble constitution and with malnutrition, and is thus produced indirectly by scrofula, rheumatism, or syphilis, each of which by its debilitating influence may give rise to a diathesis which favours such pathological changes. Foerster (Graefe's Handbuch,vii.,p.1) takes an unbiassed view of the question and says that in a total of two hundred and forty-one cases of interstitial keratitis evidences of hereditary syphilis other than the corneal disease were noted in one hundred and forty - six, that is, in sixty-eight per cent. This number was made up as follows: First, evidence of hereditary syphilis in the parents, seventeen; second, evidence of hereditary syphilis in other members of the family, fourteen; third, evidence in patient other than keratitis, one hundred and fifteen; fourth, characteristic teeth, sixty-nine; fifth, evidences in physiognomy, bones, skin, palate, or choroid, forty-six cases. In the remaining sixty-eight cases, - thirty-two per cent., - though inheritance of syphilis was not proved, there was, almost without exception, strong suspicion apart from the corneal inflammatory condition. The condition of the permanent central upper incisors was noted in one hundred and thirty-eight of the cases; of these they were typical in seventy-three, - fifty-three per cent.; suspicious in thirty-four, - twenty-four per cent.; normal in thirty-one, - twenty three per cent.

In fifteen cases the permanent teeth had not been cut, and in the remaining sixty-one there was no mention of the condition of these structures.

EAR.

It is only when the patient shows signs of being deaf that syphilitic affections of the ear attract attention; earlier than the hearing-age they escape notice in most of the cases. The only symptom likely to attract attention is a catarrh of the middle ear, which may have for its starting-point some inflammation, ulceration, or mucous patch of the pharynx, causing a temporary or permanent occlusion of the orifices of the Eustachian tubes. This may lead to perforation of the membrana tympani, purulent infiltration of the mastoid cells, etc., and when accompanied by otorrhoea which attracts attention to the ear will be easily discovered on examination. These cases are, however, exceptional, and consequently little is known about the frequency and gravity of lesions of the auditory apparatus at this early age. The changes which occur later on are chiefly those which involve either the nerves themselves or their labyrinthal filaments. Diseases of the middle ear and the Eustachian tube are said to be contemporaneous with the keratitis which appears about the age of puberty, while those of the nerve are somewhat later in point of time, and are almost always conjoined with retinitis, choroiditis, and optic neuritis. Hutchinson (Clinical Memoirs on Certain Diseases of the Eye and Ear Consequent on Inherited Syphilis,1863,pp.182,183), in 1863, wrote that it was only recently that he had thought of specially investigating the disorders of hearing in reference to hereditary syphilis, having had his attention called to a peculiar form of deafness, usually symmetrical, passing rapidly through its different stages and unaccompanied by any marked degree of pain or any external disease. He then reported eighteen cases of which he had notes. The oldest of these patients was twenty-seven, the youngest eight, the average time of development of the deafness being from twelve to fifteen. Although the membrani tympani was in no instance quite normal, in none were there found adequate changes to account for the deafness. In all the Eustachian tubes were pervious. In nearly all the disease was symmetrical. This fact, together with the absence of discoverable lesions of the external or middle ear, seems to point exclusively to disease of the nerves themselves, or at least to central cause. He later reported (Lancet,Jan.16,1875) a case of total deafness in a young woman of seventeen which had come on in ten months without pain or otorrhoea. He believes the disease of the organ of hearing to be parallel with those cases of choroiditis disseminata or of optic neuritis in which blindness is produced without pain or any external signs of inflammation, and which are distinctly and positively associated with inherited syphilis. He considers the prognosis of hereditary syphilitic deafness anything but favourable. "When the disease was progressive I have rarely witnessed any permanent improvement or arrest. In most it has gone on to

total loss of hearing, and this in several instances in spite of the cautious use of specific remedies almost from the beginning. From six months to a year would appear to be the usual time required for the completion of the process and the entire abolition of the function. Hinton (Toynbee's Diseases of the Ear) says that at Guy's Hospital, of his aural patients, one in twenty is affected with deafness due to hereditary syphilis; that it usually makes its appearance between the tenth and sixteenth years; and that the great majority of cases which he has seen have been females. "Patients," he says, "suffering from this disease may, as a rule, at least when young, be at once distinguished by the amount of deafness which they exhibit. I know no other affection except fever which in a person under twenty brings on a deafness so rapidly and so nearly complete. In the course of a few weeks a girl previously hearing well will, without pain or known cause, become unable to distinguish words." In one of Dalby's cases total deafness came on in three weeks, previous to which hearing was normal. According to Pierce, the deafness is most apt to manifest itself between eleven and eighteen years of age. Troeltsch says that hearing is lasy at an early date after the beginning of the disease, and that there are also often concomitant affections of the nose and pharynx. Dalby (Lancet, Jan. 22, 1876) looks on syphilis, next to scarlatina, as the most fruitful cause of deaf-mutism as it occurs in children born with good hearing powers. The patient usually becomes deaf in early childhood, - after he begins to talk or between this period and the purberty age.

TEETH.

Syphilitic affections of the teeth may be classed amongst the most important diagnostic features of hereditary lues, particularly when no other sings of the taint can be found. The first teeth, although showing the usual phenomena of interference with nutrition in their irregular development, opaque and chalky enamel deficient in quantity and unevenly distributed, soft and friable dentine, incongruity of size individually and relatively, and proneness to decay do not often display any distinctive evidence of syphilis. The same conditions may, and often do, depend on other causes, and are commonly associated with various cachexiae, - the strumous, gouty, rheumatic, etc., - and even with other slighter ailments tending to produce imperfect assimilation and nutritional disturbances. The same condition in the permanent teeth may be also due to other causes than syphilis. Stomatitis, however produced, - by mercury, by gastrointestinal derangements, by local irritation of any kind, - is apt to result in imperfectly-organised dental structures. Mercurial teeth, for example, are usually irregularly aligned, horizontally seamed, honeycombed, craggy, malformed, of an unhealthy yellow dirty colour, separated too widely, and deficient in enamel. The latter defect is particularly noticeable on the cusps of the sixth-year molars. There has been considerable discussion as to the effect of mercury in producing the condition of teeth known as

honeycombed, but the evidence seems to point clearly to a direct connection with the administration of mercury in infancy, either for syphilis or in excessive doses as a purge, or in some of the teething powders, which often consist of calomel and opium. Hutchinson (Proc.Odontol. Soc.,1877,p.249) once gave an interesting description of the way in which the supposition was arrived at. Lamellar cataract is a disease which affects the eyes of children who have suffered from convulsions; it was noticed that in cases of that form of catarrh there were also honeycombed teeth, and it was thought that the convulsions, the cataract, and the honeycombed teeth were all due to the same unknown cause. At last a few exceptions were found: patients with cataract, but with good teeth; lastly, it was noticed that most of the patients had been treated with mercury. So it came to be recognised that the honeycombed teeth were only accidentally associated with cataract, and that they were, in fact, the result of the mercury which had been given to cure the convulsions. The same author (Illustrations of Clinical Surgery,1875) figures a case of this disease and thus describes it: "The present state of his permanent teeth is so characteristic as to deserve a more detailed description. The change about to be mentioned affects the incisors, canines, and first molars of both upper and lower jaws, the bicuspid being scarcely implicated at all; the second molars are also quite healthy. In the first molars the alterations consist of deficiency of enamel on the upper surface of the crown, and the presence of spines of uncovered dentine. In the case of the incisors a considerable portion of the crown of each tooth is totally devoid of enamel, and its dentine is also deficient to some extent, to that the teeth are thin, sharp-edged, and of a dirty yellowish colour. The transition from the enamel-covered to the diseased part occurs suddenly in a horizontal line at some little distance from the crown of each tooth; the position of this line or step being in each tooth nearly the same distance from the gum. The general effect when all the teeth are seen together is as if a string had been tied around them when soft and the distal part had been withered. The diseases of childhood, eapecially the eruptive fevers, eclampsia, typhoid fever, etc., by temporarily arresting or greatly interfering with nutrition during the developmental period of the teeth, often cause horizontal furrows along their crowns, which are, of course, persistent during life, and mark indelibly the influence of such affections on all the processes of formation. But it must be carefully borne in mind that none of these conditions are in any way characteristic of syphilis, the special expression of which in the mouth is to be found only in the permanent upper median incisors. For the recognition and description of the peculiarities of these teeth in the subjects of inherited syphilis we are indebted to Hutchinson (Syphilitic Diseases of the Eye and Ear - Vide Chapter on The Means of Recognition of the Subjects of Hereditary Syphilis during the Tertiary Stage,p.204; The Means of Recognising

the Subjects of Inherited Syphilis in Adult Life,Med. Times & Gaz.,Sept.11,1858,p.265), dealing with the symptoms which, in a suspected case, would aid in determining the diagnosis, said: "By far the most reliable amongst the objective symptoms is the state of the permanent teeth if the patient be of age to show them. Although the temporary teeth often, indeed usually, present some peculiarities in syphilitic children of which a trained observer may avail himself, yet they show nothing which is pathognomonic, and nothing which I dare describe as worthy of general reliance. The central upper incisors of the second set are the test teeth, and the surgeon not thoroughly conversant with the various and very common forms of dental malformation will avoid much risk of error if he restricts his attention to this pair. In syphilitic patients these teeth are usually short and narrow, with a broad vertical notch in their edges and the corners rounded off. Horizontal notches or furrows are often seen, but they, as a rule, have nothing to do with syphilis. If the question be put, Are teeth of the type described pathognomonic of syphilis? I answer unreservedly that when well characterised I believe that they are. I have met with many cases in which the type in question was so slightly marked that it served only to suggest suspicion, and by no means to remove doubt; but I have never seen it well characterised without having reason to believe that the inference to which it pointed was well founded." These assertions met with considerable criticism, but it would seem that time has only served to place them on a surer foundation and to enhance their value in the eyes of the profession. That they have undergone no material change in the mind of their distinguished exponent is shown by his expressions of opinion (Lancet,1876,pp.56,535) of later date, and still later by the following memoranda which he gave as a diagnostic aid (Illustrations of Clinical Surgery, 1878. "1. No special peculiarities are to be looked for in the first set of teeth. 2. There can be no more serious blunder than to imagine that bad teeth in proportion to their badness of form are to be suspected in syphilis. 3. The upper central incisors are the only teeth which are positively characteristic. The others may afford corroborative testimony, but are not to be relied upon alone. 4. The chief peculiarity is a general dwarfing of the tooth, which is both too short and too narrow, and, from its sides slanting together, presents a tendency to become pointed. This tendency to pointing is always defeated by the cutting off of the end, the truncation being usually effected in a line curved upward, so as to produce a single shallow notch. At the bottom of this notch the enamel is deficient and the dentine exposed, but there is no irregular pitting, as in stomatitis teeth. 5. The malformations are usually symmetrical and affect pairs of teeth. The two central incisors resemble each other, and the two laterals are also alike. If any defect passes horizontally, across all the incisors at the same level, and affects them all alike it is probably not due to

to syphilis. 6. In syphilis the lateral incisors usually show little or no malformation. 7. The occurrence of the peculiarities due to syphilis and those due to mercury in the same mouth are exceedingly common." The characters of the teeth are so important when present that it is necessary to emphasise the fact that only the upper median permanent incisors are characteristic, and sometimes only one of them is typical of the disease; these teeth are usually a little apart, instead of being in apposition, and are more or less dwarfed; in a typical specimen the width of the cutting edge is narrower then the width of the tooth as it emerges from the gum; a typical syphilitic tooth presents a single notch, not a serrated margin; occasionally, if the notch has not been actually scooped out, there is a little lunula-shaped area which may readily become a notch; and, although such teeth, when present, are absolutely pathognomonic, the existence of normal permanent upper median incisors by no means indicates that the individual has not or has never had the congenital disease. It is not uncommon to hear doubts expressed as to the value of this sign in the diagnosis of syphilis. One cannot say more in favour of the diagnostic value of these teeth than that, when present in typical form, they have a certain weight in favour of the existence of hereditary syphilis in a given subject. From time to time since out author's observations the validity of his views have been questioned, both as to the fact of interstitial keratitis being due to hereditary syphilis, and to the diagnostic value of his characteristic teeth. Thus, it was asserted, not only in this country, but on the Continent, and especially in Germany, that the disease may be the result of malnutrition in scrofulous and rickety subjects; and it was maintained that the malformation of the teeth is the simple arrest of development in a perverted constitution from other causes than syphilis. Subsequently observations varied greatly as to the existence of any constancy in phenomenal expressions of the teeth in this relation. After a considerable investigation of the subject, Magitot, (Gaz.des Hop., Sept.29,Oct.4,11, & 18,1881) endeavoured to prove that dental erosions, as he calls them, are not due to syphilis, and that they are due to, or are almost invariably associated with, infantile convulsions. He collected a number of interesting facts, but a very careful study of his article and inspection of his diagrams convince one of the fact that he did not recognise at all the special peculiarities of Hutchinson's teeth, but included under his title of erosion a variety of widely-differing conditions. He altogether misinterpreted Hutchinson's views, as above cited, and represented him as at that time believing that the cause of the change in the incisors was a mercurial stomatitis. The quotation given above sufficiently refutes this absurdity. No value whatever can be attached to this objector's argument against the syphilitic origin of Hutchinson's teeth. Numerous authors have from time to time corroborated Hutchinson's observations. Thus, Moon (Bryant's Surgery Article on Surgery of the Teeth) says: "My

observations on this subject extend over some twelve years, and include some hundreds of cases; and although, in some details as to the manner of causation, I may differ from the view published by Mr. Hutchinson (before knowledge on tooth-development was advanced as it is at present), yet I must coincide entirely with his general conclusions." "The question really is this: Is there one peculiar conformation of the teeth due to inherited syphilis and not produced by any other cause? The evidence in favour of an affirmative answer to this question appears to be so strong that I think the onus of disproof rests with the sceptics." The same author also states that the most characteristic alteration in these teeth is the lessened breadth of the cutting edge as compared with that of the neck, the vertical groove on their anterior surface being almost absent, and the notch and their cutting edge being not an absolutely constant feature, and being also liable to obliteration in the usual course of wear. Tomes and many other dentists and surgeons of note have coincided in these views. Therefore, it may be taken as proved that these peculiar teeth, - stunted, abnormally narrow at the cutting edge, crescentically rounded with the convexity upward, and the surface inclined upward and forward instead of backward as in normal teeth, widely separated, but converging at their lower edges, - are pathognomonic of hereditary syphilis: the more so as Hutchinson in 1877, in spite of the fact that many years previously he had challenged any one to bring forward a patient with well-marked syphilitic teeth in whose history no evidence of syphilis could be found, and yet none had come. Hutchinson's teeth are not infrequently described as pegged, having been likened to a row of pegs stuck in the gums. This appearance is due to the fact that they are shortened, often projecting not more than half the normal distance from the gum, and are also widely separated; which abnormalities often affect the adjoining teeth as well, and sometimes the entire dentine. It has been asserted that other specific peculiarities are to be found associated with those of the incisors, and Moon (loc. cit.) describes as characteristic, and figures (Proc.Odont.Soc.,Vol.ix., pp.241,242) small dome-shaped first molars with suppressed angles and absence of enamel from the masticatory surfaces. He believes also that when the upper incisors are typical it is exceedingly rare for the lower incisors to be altogether unaffected. One of the commonest of mistakes is to confuse the normal serrations of the cutting edges of recently erupted normal incisors with the peculiar crescentic edges of the syphilitic teeth. It is very important to avoid this error. There had been considerable disputation regarding the cause of these dental changes. Hutchinson at one time thought that they were due to a stomatitis or an alveolar periostitis, but he subsequently changed his opinion and said (Proc.Odontol.Soc.,Vol.ix.,p.248) that the syphilitic tooth is the result of an arrest of development in the central or first-formed portion of the dentine. The incisors being made up of these lobes or denticles, and dwarfing of the middle one taking place, the two lateral ones fall together. This accounts at

once for the small size of the tooth, its shape of an inverted truncated cone, and its crescentic edge; the denticle theory of formation is not necessarily opposed by the fact that there is only a single undivided pulp-cavity in these incisors: instances of the separate formation of processes of dental pulp while other are being used and worn away, all of them finally to unite in a common pulp-cavity, have been observed in lower animals, as in the molar of the elephant. If the change in question were due to stomatitis, it would be more likely to be equally distributed, syphilis in its late manifestations being notably unsymmetrical; there would be no rational explanation of the involvement of one or two teeth while those on either side so frequently escaped; if it were mercurial stomatitis, the enamel would also be involved, as is not usually the case in the syphilitic teeth. It is possible that the central incisors are chiefly affected because they, with the first molars, - also affected according to Moon, - and the lower incisors, - not infrequently affected, - are the teeth which are first formed. Fournier (Arch.de Derm. et Syph.,Sept.25, Oct. 2 & 9, 1883), in the course of a learned disquisition upon syphilitic teeth, arrives at the following conclusions: The hereditary influence of syphilis shows itself in the dental system in two ways, very unequal in point of diagnostic value, namely, first by a retardation of evolution; second, by the arrest of growth and modifications of structure. The phenomena belonging to the second class may be grouped as follows: First, dental erosion. This is due to imperfect formation of the teeth, the result of a temporary stoppage in its development; but as it produces an appearance like that of worm-eaten wood, it has been called erosion, though in so far as the word conveys the idea of the wearing of a surface which has been previously normal, it is incorrect. The tooth affected with syphilitic erosion has never been normal. The different forms of erosion can be subdivided into groups according as they affect the face or the free edge or the grinding surface of the tooth. Of those involving the face there are four types: erosion in a cup-shaped form, consisting of small excavations or cups in the surface of the crown; erosions in facettes, in which the surface presents a series of small planes, as though they had been filed; erosions in which there is a linear excavation in the crown of the tooth in the shape of a transverse groove; and erosions in which the whole surface is discoloured, disorganised, and presents a honeycombed appearance. A second group of erosions affects the free edge of the tooth, and includes the Hutchinson teeth, with several less important varieties. Dental erosions are multiple, symmetrical, maintain the same level on the crowns of corresponding teeth, and are situated at different heights on the crowns of teeth of different classes. It is evident, therefore, that they are the result of a morbid influence of a general character. There are three theories as to their etiology: First, that they have no relation to syphilis (Magitot. - Treatise on the Anomalies of the Dental System, Paris, 1877; Clinical Studies on Erosion of the Teeth

considered as a Retrospective Sign of Infantile Convulsions, Paris, 1881), but are always connected with infantile convulsions; second, that they are exclusively the result of hereditary syphilitic influence; and, third, that they are simply ordinary lesions originating from syphilis with marked frequency, and even in one form, - the Hutchinson tooth, - appearing to originate only from it. This latter view is the one adopted by Fournier himself. Some of these syphilitic subjects show dental vulnerability or extreme susceptibility to all traumatic or disintegrating influences. Also recognised may be such other symptoms due to arrest of growth and modification of structure as microdontism, or dwarfing and stunting of the teeth or pegged teeth; and dental amorphism, in which the teeth are peculiarly distorted or even altered in shape.

BONES AND JOINTS.

The subjects of inherited syphilis very commonly exhibit lesions of the bones and joints. Fournier (loc. cit.) says that they are usually involved between the fifth and the nineteenth year of life; at any stage of the disease they may be observed. In the case of young children syphilitic osseous affections are mostly encountered in connection with the bones of the skull and nose, as well as in the long bones, especially the tibia. Later in life the latter bone most often shows lesions, though the skull less commonly so. Just as in the case of acquired syphilis, the essential lesions are those of periostitis, ostitis, osteomyelitis, and gummatous infiltration. The tendency is formative rather than destructive. One of the pathognomonic signs of syphilis is the occurrence of osteochondritis at the diaphyso-epiphyseal junction of the long bones. This affection is characterised by the presence of a marked widening of the cartilaginous plate between the epiphyses and diaphyses, by irregular growth of the osseous layer underneath the cartilaginous plate, and by softening at this point of junction, allowing the epiphysis to become separated. The cartilage cells are proliferated and their conversion into bone is arrested. The humerus, ulna, tibia, and femur are the bones most commonly involved; but the metacarpus and metatarsus by no means invariably escape. The more pronounced the syphilis of the parents, or the nearer the date of conception to the time at which their infection occurred, the more likely is it that several bones will be affected and the more unfavourable as regards the life of the infant will the outlook be. We find a swelling at the diaphyso-epiphyseal junction of one of the long bones, appearing in the form of a smooth ring or collar, which more or less completely surrounds the bone. In the course of some weeks, as the swelling becomes more pronounced, there may be a moderate amount of synovitis present, particularly when the lesion is in the knee or the elbow-joint. The usual remedies have a marked effect at this stage of overgrowth and infiltration. On the occurrence of softening and suppuration there will be a complete separation of the epiphyses and diaphyses, the same being evidences by preternatural mobility, crepitus, and syphilitic

pseudoparalysis, the affected members losing all power. The pus may break into the cavity of the joint, destroying the cartilage, or may burrow into the surrounding soft parts. Seldom do we find the lesions of osteochondritis occurring singly. The formative lesions involve the bones of the skull, particularly the parietal, frontal, and occipital. Sometimes macrocephalus, possibly due to premature ossification of sutures or lack of development of the brain, hydrocephalus, or lack of symmetry in the shape of the skull may be seen. The latter malformation is particularly common and characteristic. Fournier has described a number of types; thus, there are the broad, high, bulging forehead; the bossed forehead, the projections on either side corresponding to the frontal eminences, with an apparent depression in the middle; and the keeled or chicken-breasted forehead, with a median projection. The asymmetry in these cases is due to formative osteoperiostitis of the frontal bones. When the parietal bones are affected there results the natiform skull, presenting apparent broadening of the cranium, with a central depression, suggesting the shape of the nates. The term Parrot's nodes has been applied to designate the occurrence of nodes or exostoses in the regions of the frontal and parietal eminences. The degenerative lesions of the skull are characterised by the formation of neoplasms, softening, breaking down, and extensive ulceration and destruction of the tissue of the bones. After the first years of life the skull is seldom affected, though sometimes we see lesions of the bones of the nose of late occurrence. The bones of the nose and face are seldom affected in early infancy; when they are involved later in life, it is generally from an extension of disease, which primarily affects the overlying soft structures. The tibia is the bone which above all others shows lesions and has a prime diagnostic significance. Swellings and nodes are the rule, deforming the diaphyses, either flattening out the crest or by bony deposits curving it until it has the shape of a sabre. This sabre-shaped tibia is a most important evidence of hereditary syphilis, and not a few cases show the chicken-breasted chest. Cases of rarefying ostitis, predisposing to fracture, are very rare. It is possible to diagnose the osseous lesions of hereditary exostoses by the fact that they are stationary, appear later than those of syphilis and are of larger size, are accompanied by no syphilitic history or symptoms, and resist treatment by mercury and iodide of potassium. Syphilitic osteochondritis, followed by separation of the epiphyses and complicated by suppuration and sinuses, may be mistaken for a similar condition due to non-specific inflammations; the latter, however, occur much later in life, and are attended with much more acute inflammatory symptoms, and resist specific treatment; associated syphilitic affections are not present. In short, syphilitic osteoperiostitis occurs in infants under three months of age; there is a history of syphilis in the child and its parents; other bones are implicated; it is coincident with the development of the shaft of the bone; nodes, skin eruptions, and other

lesions of syphilis are present; there is a marked localisation of the disease; the lymphatics of the limb are unaffected; and early specific treatment has a markedly beneficial effect; - whereas non-syphilitic osteoperiostitis seldom, if ever, occurs in children under one year of age; there is no history of syphilis, though sometimes one of traumatism; it is generally confined to one bone; it coexists with the ossification of the epiphyses; there are no characteristic skin eruptions; pain and redness and swelling are very marked; it involves neighbouring parts; lymphangitis is sometimes present; and antisyphilitic treatment is useless. Rickets so often complicates syphilis that the latter is not infrequently regarded as the essential etiological factor in the development of this bone lesion. This, however, is not the case. As in the case of tuberculosis, which often runs its course in conjunction with hereditary syphilis, rickets is a distinct affection by itself. For the purpose of differentiation, it is useful to bear in mind that in osseous diseases due to inherited syphilis the swellings, particularly those of the long bones, show themselves at or soon after birth; whereas rickets seldom makes its appearance before six months, and usually still later. In syphilitic hereditary osteopathy there is a history of syphilis or evidence of existing syphilis in one or both parentsl whereas in rickets no such history is necessarily obtainable. The syphilitic disease is preceded or accompanied by snuffles, coryza, and lesions of the skin and mucous membranes; whereas in rickets no such prodromata are present. In the former affection prodromata recognised as characteristic of rickets do not precede the osseous lesions; in rickets the bone troubles are often preceded by such symptoms as pallor, restlessness, sweating, nausea, and diarrhoea. In syphilis cachexia is absent or moderate; in rickets cachexia is marked. In the former case physiognomical peculiarities of syphilis are present; in rickets no such grouping of phenomena is observed. In syphilis there are circumscribed tumours on the parietal or frontal bones, seldom on the occipital; in rickets the cranial bones are thickened in spots, usually upon the occiput. In syphilis the ribs are not markedly affected; in rickets all or nearly all are involved. In syphilis disease of the ribs, when existent, is not ordinarily coincident with that of other bones; in rickets nearly always so. In syphilis the fontanelles close at the usual period; in rickets closure is delayed. In the former affection other syphilitic symptoms are present, such as enlargement of the phalanges and of the metatarsal bones; in rickets there are no syphilitic symptoms. Syphilitic osseous lesions are often accompanied by sinuses, synovitis, abscesses, cutaneous ulcers, and the like; in rickets there is little external or surrounding involvement. The former usually disappear by resolution, without leaving any permanent change; in rickets there usually remain some bending of the shaft and distortion of the neighbouring joint. The mortality amongst syphilitic children in whom many bones are involved is very great; in rickets the mortality is less. Mercury and iodide of potassium are of signal

service in syphilis; in rickets these drugs are of no use. In the first stage of hereditary syphilitic osseous lesions there is exuberant calcification of the ossifying cartilage, causing necrosis of the new-formed tissue and a consecutive inflammation, which ends in the separation of the epiphyses; in rickets this is less marked, there being often formed instead a soft and non-calcified osteoid material. Dactylitis is of very frequent occurrence in syphilitic children; the lesion is of the subcutaneous and periarticular tissue, or the affection may commence in the bone or periosteum and later implicate the periarticular fibrous structures. The deep form is a specific osteomyelitis, and often destroys the bone and the joint. The lesion is commonly observed in connection with the articular ends of the first phalanges. In syphilitic dactylitis there appears an ill-defined, fusiform, purplish swelling, which softens, breaks down, and discharges. The lesions are often multiple, painless, affect the fingers rather than the toes, and in the more serious forms lead to destruction of tissue and great interference with the growth of the child. Syphilitic dactylitis has to be distinguished from rheumatoid arthritis, felon, enchondroma, exostoses, and tubercular lesions. Rheumatoid arthritis begins primarily in the joints, and is associated with other characteristic symptoms. Felon presents the symptoms of acute inflammation, and is rapid in its course. Enchondroma and exostoses develop much more slowly, and are more circumscribed. Dactylitis of tubercular origin pursues a slower course, is seldom symmetrical, disappears very slowly, may show the tubercle bacilli, and gives no response to mercury or iodide of potassium. A form of hereditary syphilitic articular disease is described by Fournier (loc. cit.) as arthralgia, and as characterised simply by the presence of pain. It is apparently causeless, is irregular in onset, varies in degree, and exhibits nocturnal exacerbations. The hereditary articular lesions are much the same as those observed in the acquired disease. Our author mentioned three forms of arthrosis. The first presents the appearances of simple chronic hydrarthresis. It would seem that the affection of the joint masks an osseous lesion, perhaps an inflammation of the periosteum or of the epiphysis. The second form shows the symptoms of syphilitic white swelling. There is a somewhat globular tumefaction, made up of almost entirely an extensive hyperostosis of the epiphyses, aided by moderate synovial effusion. There are no involvement of the skin, discoloration, heat, oedema, or inflammatory phenomena. The neoplasm gives the palpating finger the impression of bony hardness. It is not sensitive and does not occasion the patient any pain. The affected part can be moved about as usual, with but slight inconvenience. The third form shows deforming arthropathies dependent upon epiphyseal malformations. The shape of the swelling is irregular and at times extraordinary. Osteophytes materially interfere with function, and sometimes occasion complete ankylosis. The muscles waste and the affected part is arrested in development when they occur in early childhood.

LYMPHATIC GLANDS.

Congenital syphilitic cases may show a painless, slow, and non-suppurative affection of the lymphatic glands, particularly in the case of the anterior cervical group, which, when affected, seldom, or never, attain a large size, and remain for a long time without undergoing any marked change. These enlarged glands are to be found just where the tubercular glandular enlargements are most often seen, and in the early stage of their development they present much the same symptoms. From the tuberculous condition they can be distinguished by the therapeutic test, the absence of ulcerative tendency and of general adenopathy, and the permanency of the growth.

NERVOUS SYSTEM.

Hereditary syphilis seems to be less capable of attacking the nervous system than the acquired disease, but is certainly at times so operative. As early as 1779, Joseph Glenck (Doctrina de Morbis Venereis, Vienna, 1779), reported a case of a girl, six years old, cured by a mercurial course of an epilepsy of three years' standing and of other manifestations of hereditary syphilis. Graefe (Arch.f.Ophthal.,Bd.1,Erst Abth.) found gummatous tumours in the cerebrum of a child nearly two years old. Huebner (Virchow's Arch.,Bd.84,269) details the occurrence of pachymeningitis haemorrhagica in a syphilitic infant under a year old. Chiari (Wien.med.Woch.,xxxi.,1881,17) reports a case in which very pronounced syphilitic degeneration of the cerebral vessels was found in a child fourteen months old. Both Barlow (Trans.Path.Soc.,1877) and Dowse (The Brain and Its Diseases, Vol.i.,p.76) report cases of nerve syphilis in male infants of fifteen months. Parrott (Arch. de Phys., 1871-72,p.319; Lectures on Hereditary Syphilis, Progr.Méd.,1877,1878), Troisier (Arch.de Tocolog.,x.,411), and others give similar instances. For a long time authorities took as their only guide to the course and progress of the nervous affections of hereditary syphilis analogy. It was well known that in acquired syphilis three forms of cerebral disease could be recognised in a general way: one characterised by sudden attack of paralysis, in which the lesion was usually thrombosis from specific endarteritis; one in which the symptoms of cerebral tumour were present, and in which gummata were the cause of the trouble; and one in which the pain, headache, and various functional or convulsive disturbances, - chorea, epilepsy, paralysis of single nerves, etc., - were the customary phenomena, and in which periosteal, meningeal, or neuroglial thickenings constituted the pathological basis. Both symptomatologically and histologically the last two were often intermingled. Heubner (loc. cit.) divides syphilis of the brain into three groups, two of which very closely resemble those just described. In one, however, he includes both the general physical disturbances, incomplete paralysis, and final coma characteristic of tumour and the epileptiform attacks so often due to peripheral or meningeal irritation. This combination is explained by the results of his autopsies, which disclosed in twenty-six cases in which these symptoms were conjoined a gummatous growth in the pia mater of the convexity of one

of the cerebral hemispheres, either limited and superficial or involving more or less of the cortex and forming a distinct tumour. The epileptiform attacks were present in nineteen out of these twenty-six cases, while in twenty other cases where the growth was limited to the white substance at the base of the brain they were present only twice. This second form is the apoplectic, followed by general hemiplegia, and depending upon diseases of the arteries of the brain. His third division is a very ill-defined one, depends much for its limitations upon the subjective symptoms, and is of no special interest as applied to the subject of the congenital disease. Althaus (Med. Times & Gaz.,Nov.10,1877) also makes three divisions, two of which are as follows: First, cerebral tumour, in the form of either a hard or a soft gumma, and characterised by nocturnal headache, insomnia, epileptiform attacks, and the various phenomena induced by involvement of the cerebral nerves, etc. Second, disease of the arteries, apoplexy, or softening followed by hemiplegia. Hutchinson (loc. cit.) makes a similar division of lesions and symptoms, and the observations of Jaksch, Wilks, and Hughlings Jackson more or less closely coincide with this general classification. Now, in spite of certain striking differences, - more apparent than real, however, - between inherited and acquired syphilis as regards cause, duration of stages, etc., the essential pathological changes are the same. When syphilis in its later periods attacks the brain or spinal cord or nerve-trunks of a foetus, it proceeds just as in the adult, the same characteristic accumulation of cells taking place and setting up an arteritis or a meningitis, thickening the sheaths of nerves, or constituting a pericranial node or a gumma according to their number and their situation. One would accordingly expect to find in subjects of inherited syphilis manifestations closely allied to those observed in the adult; and the observations of Barlow (loc. cit.), Graefe (loc. cit.), Jackson (loc. cit.), Huebner (loc. cit.), Dowse (loc. cit.), and Hutchinson (loc. cit.), though comparatively few in number, have already established this hypothesis. Thus, in these patients meningitis, growths, and arterial disease constitute the three clinical divisions of the disease which have been distinctly differentiated, and the reported cases, with or without sutopsy, fall naturally into these divisions. To make these cases absolutely reliable, it is necessary to have unmistakable evidence of hereditary syphilis in some form and the demonstration of syphilitic lesions at an autopsy. The case of Dowse (loc. cit.,pp. 71-75), however, includes these requirements. A child, twelve years of age, of syphilitic parents, with a history of coryza, sore eyes, and a tubercular syphilide, was attacked with epilepsy, diplopia, facial paralysis, etc., and finally died. At the autopsy three gummatous growths of the surface of the brain were found, and the vessels of the base were found to have undergone the special changes described by Huebner. Their lumen was in some places nearly occluded by an accumulation of spindle-shaped cells between the tunica fenestra and the epithelial lining;

and interspersed with them, but particularly in the muscular and adventitious coats, were to be seen enormous quantities of round cells which in many parts seemed actually to replace the normal structures. Dowse's other cases are not at all conclusive in their clinical histories, and in none of them was the diagnosis confirmed by autopsical observations. Barlow (loc. cit.) has reported two very interesting and important cases in very young children. A child, four months old, with snuffles, serpiginous ulcers, etc., and with a syphilitic father, had epileptiform attacks, followed by laryngismus, carpopedal contraction, and changes in the choroid. She died aged about fifteen months, and the autopsy revealed thickening of the pia mater, evidently not tubercular, and changes in the arteries, which in the gradual narrowing of the lumen of the vessel, the absence of ulceration and disintegration or calcification, and the continuity and extent of cell-proliferation are as different as possible from ordinary atheroma, but correspond precisely with the description of Huebner's cases, which were undoubtedly the subjects of acquired syphilis. In the second case reported by Marlow the symptoms were associated chiefly with the cranial nerves. These were nystagmus, paresis of facial muscles, laryngeal spasms, etc. He died at the age of fifteen months. The vessels of the brain were extensively diseased as in the other case, and the fourth, fifth, seventh, and eighth pair of nerves were smaller by a new growth of gummatous nature which had produced almost entire atrophy of the nerve-cylinders. There were cicatrices of the liver and spleen. Several cases have been reported in which the diagnosis rested upon the history, upon the co-existence of undoubted syphilitic symptoms, and upon the prompt response to the therapeutic test. A typical case of syphilitic epilepsy is reported by Berkely Hill (loc. cit.). A girl, aged nine, was the first child of the family that had lived, two having previously been born dead. She presented characteristic teeth, traces of choroiditis, and, while under treatment, suffered from both keratitis and iritis. Her first fit was when she was four years of age, and the attacks had recurred frequently since that time. The convulsions was confined to the left side. The left arm was very weak, the weakness having come on gradually, and being especially great in the extensors of the wrist. Under specific treatment the attacks ceased entirely. In this case there was certainly organic disease, probably a gumma in the surface of the right hemisphere of the brain. The same writer tells of several instances of nervous affections in inherited syphilis; and these and the others already detailed would seem to justify the statement that the nervous diseases of inherited syphilis fall into the same general category as those of the acquired disease; that they may appear at any age, from three to four months to that of puberty; that they depend for their production upon a cellular proliferation which, according to its locality, results in the development of new growths, the production of localised meningeal inflammations, or the obstruction and inflammation of arteries; and that the symptoms are those usually associated with such pathological changes, and diagnosis of

syphilis depending mainly on the history and presence of other specific phenomena. The prognosis is more unfavourable than in similar cases in acquired syphilis, the meningeal and vascular lesions being the most frequent and showing themselves even under careful treatment. Spinal affections, chorea, and idiocy have been attributed to congenital syphilis, but it must be only very seldom that such is the case. Berkely Hill (loc. cit.) tells of a child, aged five years, who had been hemiplegic since he was two and a half years old, and who developed paralysis of the flexors of the ankle in each leg. The same author reports another case in which there was imbecility associated with hereditary syphilis, but this may or may not have been merely a coincidence. Keyes (loc. cit.) describes the case of a boy, aged five, who had nodes on the tibiae and other signs of inherited syphilis, and who had two attacks of paraplegia. Beach (loc. cit.) found not more than one per cent. of syphilitic children in his asylum, and Mercier (Nouv.Dict.de Med. et Chir.,p.255) could only trace syphilis in five out of two hundred and twenty female idiots, probably born in that condition. Jackson (loc. cit.) only found one case of inherited syphilis amongst eighty cases of chorea; and Alison (Am.Jour.Med.Sci.,July,1877) reports another instance. When a nervous affection makes its appearance first at a comparatively late period, and no very apparent evidences of the inherited taint are present, there is a great danger of the case being misunderstood; indeed, in some instances an immediate diagnosis may be almost impossible. It is probable that in most of the reported recoveries from alleged tubercular meningitis, the disease has been syphilitic. Dreyfous (Rev.Mens.Des Mal. des Enfants,1883,i.,497; Gaz.Hebd.Sci.Med. de Montp.,1883,v., 89) once saw, in a child of fourteen, a chronic basal meningitis; and in the absence of any history and of any evidences of syphilis gave the fatal prognosis of the tubercular disease. But to his astonishment, under the long-continued exhibition of the iodide, complete recovery occurred. Another case of what was diagnosed as tubercular meningitis was cured in the same way. It is obviously very important to diagnose between a tubercular meningitis and one due to hereditary syphilis. Without a history certainty is impossible, but a general indefiniteness of symptoms and slowness of progression should arouse suspicion, especially if the absence of the puse-retardation indicated that the vault rather than the base of the cranium was involved. Mendel (Virchow's Srch.,Bd.38,p.129) and others have reported cases of hydrocephalus of undoubted syphilitic origin; and it would appear that arrested development, and the consequent epilepsy, idiocy, early brain sclerosis, etc., are probably sometimes due to inheritance. Classed as hereditary parasyphilitic diseases may be the rare instances of juvenile tabes and paretic dementia, as well as deficient vitality, undersizedness, infantilism, mental defects, idiocy, hydrocephalus, and various other affections of cerebral and spinal origination in children of undoubted taint.

LUNGS.

The lungs are more frequently attacked by hereditary

than by acquired syphilis. In the syphilitic foetus born before term, in thessyphilitic child born dead at full term, and in the syphilitic children who live a few days, there are found at the autopsy, in the lungs, nodules or tumours, usually superficial, sometimes deep, hard, isolated, or in groups, pink, grey, or red, in colour, with scattered whitish or yellowish points. Their size varies from a pea to a small walnut. They represent a portion of the lung more or less considerable existing in a state of special lobular hepatisation. Sometimes an entire lobe is involved. The affected portion is very dense and covered with thickened inflammed pleura. The lesions are those of chronic pneumonia. The interlobular connective tissue enters into proliferation and presents a large quantity of embryonal cells; the alveolar walls are thick, while the narrow alveoli are livid, and even filled with epithelial cells, which are of the pavement variety in contact with walls, round in the centre of the alveoli. As the progess progresses the epithelial cells become fatty, degenerated, and subsequently broken down and absorbed, while the embryonal interalveolar tissue rapidly organises into fibrous tissue. In this way a small fibrous tissue is formed, in which a gumma may ultimately make its appearance. There is very little likelihood of confounding this syphilitic pneumonia with tuberculosis. Hereditary cases never present the granulations of tubercle. The fact that in syphilitic interstitial hyperplasia the change begins in the interlobular connective tissue and around the cells, at first consisting of small spindle-shaped and roundish cells which rapidly develop into connective tissue, and the fact that blood-vessels are freely produced among the fibres of this new tissue, would seem to constitute its most distinctive features. Gummata in the lungs of children suffering from inherited syphilis have frequently been observed. They appear likewise to begin in the walls of the blood-vessels or the bronchioles. They differ from tubercular nodules in being confined to one lung. Children suffering from gummata in the lungs live only a few days or weeks.

LIVER.

Hepatic syphilis is a very common affection of congenital cases, in still-born children such lesions being remarkably constant, and sometimes the liver being the only viscus involved. Long ago Gubler described the general appearances in syphilitic disease of the liver in newborn children, which was distinguished especially by its increase in size and weight. This increase depended, as might be expected at this stage, - that of general cellular proliferation, - upon a proliferation of cells from the connective tissue between the acini, or from the adventitia of the interlobular vessels, this growth being transformed into connective tissue. The change is quite analogous to what is taking place at the same time in the skin, the mucous membranes, and other tissues. Wilk (Trans.Path.Soc.,Vol.xxvii,1866) described also a form of syphilitic disease of the liver which corresponds to that of Gubler, in which the

whole organ is infiltrated with a new fibrous tissue, producing a uniform and general induration. In the case of the lesion described by the last-mentioned author (Memoirs on a New Disease of the Liver, 1852; Gaz.Méd.de Paris, 1852) the liver in such children is hypertrophied, hard, and so resistant to pressure that it cannot be indented; it is elastic, so that it rebounds; it cracks, but does not bleed, when it is cut into, and presents the yellow colour and the semitransparency of flint. There are seen on a yellowish ground a number of small white granulations like grains of wheat, which a histological examination shows to be formed by an accumulation of embryonic cells in the spaces which separate the hepatic acini. Injections reveal the fact that the vascular network has become almost impenetrable, the capillaries obliterated, the larger vessels diminished in calibre. Fibroplastic material is found throughout the organ in large quantity. In consequence of these conditions, - the compression of the hepatic cells and the destruction of the vessels, - the secretion of bile is stopped, and the gall-bladdar is found after death to contain a pale-yellow liquid consisting of bile mixed with an excess of mucus. This form of hepatitis has been observed almost exclusively in infants. Cornil (loc. cit.) says that he has had frequent occasion to examine such cases of hepatic syphilis, and describes them as follows: "The hepatic acini, in the normal state, are in contact except at the prismatic spaces which are formed by their union - spaces in which the capsule of Glisson forms an envelope to the afferent portal vessels of the lobuli. It is in these spaces that the round lymph-cells form and collect into small nodules representing microscopic gummata. The cells at the centre of the new formation are sometimes granular. This neoplasm is situated about the ramifications of the portal veins, which in consequence also present thickened walls with newly-formed cells in their external tissues. The small granules above mentioned are not always visible to the naked eye, and in their places are only seen, about the perilobular capillaries of the portal vein, an excessive number of embryonic cells." In addition to this interstitial sclerosis or interstitial infiltrating hepatitis there is an inflammation of the liver depending upon the presence of gummata, - gummatous hepatitis, - which occurs in two forms: one in which very small and very numerous nodules are present, situated along the course of the fibrous seams, the prolongation of the capsule, and another in which there are two or three large circumscribed tumours. This form of hepatitis is always accompanied by the interstitial form, although the latter may be only slightly developed; it does not differ essentially, either pathologically or clinically, from the lesion in adults. The gummata, though not infrequently found in the liver of newborn infants, are mostly developed later, at from about the eighth to the twelfth year of life. Rochebonne (cited by Bumstead and Taylor. - loc. cit., p.858) described the following symptoms of syphilitic hepatitis in infants: A deep wine-coloured venous stain and oedema of the lower extremities, often accompanied by

pemphigus; ascites due to mechanical obstruction of the circulation, as in cirrhosis; a more or less pronounced chloroanaemic appearance of the countenance; and the presence in the urine of albumin and haematoglobulin. Vomiting may occur, and constipation alternating with diarrhoea has been observed. None of the cases show a symptomatic jaundice. According to Bäumler (loc. cit. p. 194), implication of the liver may be recognised by the pain in the region of the liver. In newborn infants, - unless, possibly, there may be some enlargement of the liver, - the only local symptoms often are due to peritonitis, such as screaming, drawing up of the legs, and vomiting. Not a few of these cases suffer from a diffuse peritonitis. "Of the liver," says a writer in the British and Foreign MedicoChirurgical Review (1875, p. 28), "the lesion consists in enlargement and induration of the organ in whole or in part, due to the development of fibroplastic material between the cells of the acini, with obliteration of the vessels and interference with the secretion of bile. This condition is generally doubtful during uterine life, and is rapidly fatal. The symptoms are vomiting, diarrhoea, and tympanitis, but, strange to say, no jaundice. The enlargement and indurated organ may be felt by palpation. It is probable that in this connection the peritonitis described by Simson as occurring in inherited syphilis is found." Hill(loc. cit.) thinks that the symptoms are mainly those of functional derangement of the organ, with alteration in its dimensions. Hutchinson (Trans. Path. Soc.,1877,p.309) described cases in which, in young persons the subjects of hereditary syphilis, there had been great enlargement of the liver which subsequently disappeared. He found it difficult to believe that there is any kind of gummatous growth in such cases, and felt obliged rather to fall back upon the hypothesis of mere vascular turgescence. In one such case the liver occasionally was so large as to be visible as the patient lay in bed; illustrative cases of this condition were published in the "Medical Times and Gazette" (Dec.22,1877). According to Cornil (loc. cit. p. 282), the symptoms are nil, or they are identical with those of local and general affections so often observed in children who have been poorly and insufficiently fed; the only physical signs which properly belong to syphilis of the liver is, when it exists at all, enlargement of the organ. It would seem that the enlargement is due to an exceptionally active cellular proliferation, which does not, however, proceed to organisation, but may be just as susceptible of absorption and resolution as are the papules or maculae of the skin. A portion of the enlargement may be due to passive congestion caused by the presence of this accumulation of cells. Barlow (Trans.Path.Soc.,1877,p.255) suggested that the engorgement is only a preliminary stage of the fibrous thickening, and may disappear either with or without leaving permanent contractions or adhesions in its wake.

SPLEEN.

In about a fifth of the cases of hereditary syphilis

the spleen is enlarged at birth or shortly afterwards; and the lesions of the organ are of twofold importance. Splenic disease is a valuable aid to diagnosis, and by its size and degree of persistence of the swelling one can gain an approximate idea of the severity of the case. Gee (Brit.Med.Jour.,1867,Vol.i.,p.435) seems to have been the first to call attention to the frequency and importance of enlargement of the spleen in early hereditary syphilis. He described the histories of thirteen children in support of the statement that such enlargement occurred in almost a fourth of all cases of hereditary syphilis, sometimes with, sometimes without, enlargement of the liver and lymphatic glands. According to him, the degree of splenic enlargement may be ~~mistaken~~ as a sort of index of the severity of the cachexia; the majority of cases with great enlargement die, but sometimes such children survive, the spleen gradually diminishing in size as the health improves - not diminishing, however, pari passu with such improvement, but remaining for a long time a monument of past cachexia. Ten years later, Barlow (Trans.Path. Soc.,Jan 20, 1877) thought Gee had rather understated the proportion of cases in which splenic enlargement occurs, he having found it in twenty-two out of twenty-eight children with definite hereditary syphilis. Birch-Hirschfeld, Eisenschitz, and Tepel (cited by Hill and Cooper, loc. cit.) corroborated these observations, finding that the enlargement of the spleen is almost invariable and that the organ is not infrequently twice as large as under normal conditions. Tyson (Lancet,Oct.23,1880) reported a cure of a child born of syphilitic parents, in whom, at the age of two, the spleen extended downwards three and a half inches, reaching the crest of the ilium and approaching closely to the umbilicus. The liver was not enlarged; the urine was not albuminous. He prescribed gray powder, one grain every morning and evening, and one grain of iodide of potassium, with ten minims of the syrup of the iodide of iron to an ounce of water, three times a day. Sixteen months later the spleen had become imperceptible, and the patient seemed to have been perfectly cured after the lapse of three years. According to Barlow (Brit.Med.Jour.,Jan.20,1877), the diminution of the liver under treatment seems to occur before there is a reduction in the size of the spleen. This persistence of the latter renders it, as has been stated, a valuable diagnostic sign. Macnamara and Barlow (Brit. Med.Jour.,Dec.16,1882) allude to this as follows: Enlargement of the liver, although it ought to be noted because it is often present in hereditary syphilis, has but little value as a confirmatory symptom - first, because the liver is proportionately large in infancy, and it is difficult to state the limit of what is actually normal; and, secondly, because other causes besides congenital syphilis lead to its increase in size. But with splenic enlargement the case is different. Gee's observation, that in the early stage of infantile syphilis some enlargement of the spleen occurs in a large number of cases,has been abundantly confirmed. Although with the subsidence of

other symptoms this enlargement often disappears, so that on post-mortem examination two or three months after there may be no trace of it, yet in a few cases it persists, and indeed sometimes increases, so as to be considerable when the other signs have quite vanished. The importance of this sign is greatest when noted early; as, for example, when the child is from two to three months old, for at that period the enlargement of the spleen due to rickets is practically out of the question. The condition of the spleen during this period of enlargement seems to be simply that of hyperaemia, or at the most of hyperplasia, various autopsical reports showing no evidence of new growth or of amyloid or other alterations. It would seem that the cause is in all probability the well-known effect of syphilis on the glandular system in general, and the lymphatic system in particular to which the spleen is generally assigned. The analogy between this slow, persistent, painless enlargement preceding the cutaneous eruptions, unaccompanied by inflammatory symptoms, unattended by any breaking down of tissue, subsiding slowly but unevenly under specific medication, and the behaviour of the buboes of acquired syphilis is undoubtedly very remarkable and interesting. Finally, it may be noted that Parrot (Le Mouvement Méd., Paris, Nov. 23, 1872) described two forms of splenic disease produced by hereditary syphilis: First, a simple hypertrophy, which he considered secondary to diffuse infiltration of the liver, obstructing the portal circulation and causing the spleen to act as a reservoir. Second, an inflammatory condition resulting in the formation of false membranes around the capsule. His explanation of the first condition is unsatisfactory, because there are numerous cases in which the spleen is enlarged without there being any involvement of the liver; and his other observations have not been confirmed.

PANCREAS.

Birch-Hirschfeld (loc. cit.) had occasion to examine the pancreas in the case of seventy-five syphilitic foetuses. In thirteen of them he found enlargement of the organ with increased weight and density, proliferation of connective tissue, and in some cases compression, almost obliteration of the lobules, with atrophy and fatty degeneration of their epithelium. Klebs (loc. cit.) discovered a gumma in a six-months foetus; and gummatous infiltration of the organ has been found in some of the more malignant instances of the hereditary disease. It is practically impossible to diagnose disease of the pancreas during life, and the serious associated lesions of other organs invariably dominate the case.

INTESTINES.

There are in most cases of congenital syphilis evidences of disturbance of the gastrointestinal tract. Well-known, but obviously uncharacteristic symptoms are vomiting, diarrhoea, colic, anorexia, and emaciation. It has been supposed by certain observers that the mucous membrane of the entire tract is probably, during the early period at least, and coincidently with the cutaneous eruption, in a condition of hyperaemia and

irritation comparable to that of the skin; in the opinion of Hutchinson (Lancet, Feb.6, 1876), "there is surely no a priori probability that a blood disease so severe as syphilis should produce lesions on the skin, in the mouth, and in the eye only - that it should, in fact, affect all the visible parts and avoid all the concealed ones. Whether the condition can be compared to the syphilodermata or not, or whether it is due to associated involvement of the glandular apparatus, ~~it~~ is a mooted point. Foerster (Cited by Bumstead and Taylor, - loc. cit., p.757) found fibroid degeneration of Peyer's patches in a syphilitic infant who died six days after birth, the glandular structure having been replaced by elevated grayish-red masses of nuclei, cells, and connective tissue. His observations have been confirmed by Eberth, Roth, Oser, and other writers. There appears to be nothing specific about the ulcers of the intestines which have from time to time been described.

KIDNEYS.

These organs are seldom affected by hereditary syphilitic lesions; diffuse interstitial or gummatous changes may be seen, however, in more malignant cases.

TESTICLES.

In rare instances, about the first year of the patient's life, the testicles may show signs of syphilitic invasion. The organ slowly and painlessly enlarges. The epididymis may be involved in the swelling, and there may be an associated hydrocele. Few cases show softening and ulceration, resolution evidently occurring, not infrequently followed by marked atrophy of the organ, which, however, can be readily prevented by the usual antisyphilitic means. For the purpose of diagnosis it should he remembered that enlargement of the testicle in infancy not due to traumatism is suggestive of syphilis or tuberculosis. It is most ~~un~~likely the former if the swelling never reaches a great size, if it shows no tendency to ulcerate, and if it primarily attacks the testes.

D I A G N O S I S.

A C Q U I R E D S Y P H I L I S.

GENERAL DIAGNOSIS.

There can be no gainsaying the importance of the recognition of a syphilitic disease; for the life of the patient is at stake, as may be the health of the future generations, and the safety of the community at large is also involved.

The difficulties contingent to the recognition of acquired syphilis are materially increased by the number and variety of the symptoms observed; indeed, there are no symptoms by means of which the affection can be diagnosed in all its stages. Nearly four hundred years ago, Jessen, a Hungarian physician, said that a white pellicle on the surface of the blood drawn from a vein pointed to the presence of syphilis when it adhered to the rest of the mass like a tenaceous skin. This was confirmed by some of his contemporaries, but disproved subsequently by Astruc (op. cit.,T.iv.,pp.106,107). There are no microscopical signs by means of which the malady can be recognised; and it remained for bacteriologists to come to the rescue with the Wassermann test, the value of which will presently be discussed. The demonstration of the spirochaete pallida is conclusive evidence of syphilis; but so far it has not been applied to all the stages of the disease. It is necessary to take into consideration all the clinical phenomena, examine them from every point of view, weigh and compare them, and form an opinion on the symptom-complexus observed. In not a few instances the diagnosis is self-evident, while in others it is next thing to impossible. We cannot diagnose the affection, for instance, during the stage of incubation, though in most cases the subsequent periods can be recognised readily enough. Too great reliance should not be placed on the patient's statements, for he is apt to attribute every ache and pain to the affection. The history of the case is of great utility as has on many occasions already been shown; still it is not always reliable. The discovery of old syphilitic lesions is of great value in diagnosis. The entire body of the patient should be examined carefully, with special reference to the condition of the legs, bones, glands, mouth, and genitals. Very suggestive would be the discovery of thin, rounded, depressed, pigmented cicatrices, thickened tibiae, enlarged and indurated indolent glands, destruction of the papillae of the tongue, and an old scar on the penile organ. Of service also are perforation of the palate, flattening of the nose, and numerous abortions without obvious non-specific cause. The discovery of active lesions is proof-positive of the existence of the disease, if they can be diagnosed as due thereto. It is sometimes necessary to practice the therapeutic test for diagnostic purposes. The idea is to treat the lesion as if it were syphilitic, and to give mercury or iodides, or both,

according to the nature of the lesion. Generally a three weeks' course of mild treatment is all that will be required, but sometimes a more vigorous medication, such as injections, may be needed. It is easy to make a mistake in the diagnosis of syphilis, some cases being diagnosed as such when there is no such disease present, and vice versa. In either case the error is heinous, and too much care cannot be taken in the affirmations used.

DIAGNOSIS OF STAGES.

PRIMARY STAGE.

The diagnosis of the PRIMARY STAGE is easy when, after a definite exposure and a latent period of three or four weeks, a sore develops on the genitals, which becomes indurated and associated with enlargement and induration of the associated lymphatic glands. But it must be borne in mind that the chancre is not always typical, and that it is sometimes of extragenital location. In these atypical cases the diagnosis presents sometimes no considerable difficulty. Soft sores, which appear soon after exposure on the genitals and are associated with suppurating buboes, may contain the spirochate pallida and ultimately become indurated. It is thus that, unless the spirochaete pallida can be demonstrated, it is impossible in some cases to be sure that the disease is of the specific sort. If the organism cannot be found, it is not possible to diagnose a sore as syphilitic until induration of its base and of the anatomically associated lymphatic glands and secondary symptoms occur. We have already seen that in the case of the female the chancre is less typical, though every ulcer and parchment-like induration is suspicious, indeed more than suspicious, should the anatomically associated lymphatic glands enlarge. In general, the diagnosis must be based upon the character of the sore, the history of the case, the occurrence of the secondary symptoms in usual course, and, above all, the demonstration of the specific microorganism. The chancre is generally single, small, uninflamed, indurated, and eroded; and, as a rule, it lasts for more than a week. The uniqueness of the chancre is not absolute, as there may be more than one observed, as there may be more than one present. Absence of inflammation is noticed only when there is no pathogenic microbes present. In the absence of secondary infection the glands are enlarged, firm, indurated, indolent, and free from periadenitis. The history of exposure and of a period of incubation are very useful in combination with the other clinical phenomena. When the spirochaete pallida can be demonstrated the diagnosis is settled, but it must be borne in mind that it is not always easy to isolate it, and that an expert examination for its presence will not infrequently be required. Generally speaking, the recognition of the chancre is chief in its importance in the recognition of the disease. Such recognition depends upon several factors, no one of which can be omitted with safety. First and of prime inportance is the history with reference to the time of suspected

infection. Sores appearing within ten days after exposure to a possible source of infection are probably not syphilitic in nature. Those occurring later than ten days, and especially at about the end of the third week, are to be regarded with suspicion. Reference must he had, in determining the length of time that has elapsed since contamination and the appearance of the sore, to records not only of the last, but of previous indulgences in sexual intercourse. A sore may be found upon the genitals shortly after coitus that in reality had its origin some weeks previously in a similar exposure. The production and examination of the person suspected to be the source of the trouble is always a desirable, but often an unpleasant and impossible means of verifying the diagnosis. The appearances of the chancre furnish another means of confirming the diagnosis. Not infrequently these features are the only evidences obtainable upon which to base conclusions. The initial lesion of syphilis, we have seen, is usually single, in contradistinction to the lesion of chancroid, which is almost invariably multiple. The inflammation exhibited in chancre is not so intense nor acute as in chancroid. The chancre is nearly always indurated, the chancroidal lesion is never so. It must be remembered, however, that in the early stages of chancre the induration may be so slight as not to be perceptible, and that in some regions, as in the vagina, it may never appear. It should also not be forgotten that the use of caustics upon a simple lesion may produce a condition simulating very much the indurated oedema of chancre. Inquiry with reference to the previous use of such applications is essential. It is injudicious to be positive in one's statements concerning any sore upon the genital organs in respect to which conclusions alone can be based. The better practice by far is to wait for more definite symptoms. These are soon manifested in case of chancre by enlargement of the neighbouring lymphatic glands. When the sore is situated upon the penis the glands in both groins are enlarged. Rarely but one inguinal region shows this symptom. This, however, need not be confused with the enlargement shown in chancroid. In chancroidal bubo inflammatory phenomena speedily appear; the gland becomes painful and boggy to the touch, the skin reddens and suppuration occurs; while in the bubo of chancre remains firm and movable underneath the skin, is not painful, and, unless complicated by chancroid, never proceeeds to suppuration. In the case of males with genital lesions the body surface should be freely exposed. Before examination of the sore is made it should be the rule to pass the tips of the fingers firmly over both inguinal regions. If any enlargement of the glands has taken place, it can be readily noticed. If the investigation of the groins be made thus early, it will not be neglected, as is apt to be the case when the fingers have become soiled in handling the chancre. To search the inguinal region first is a valuable procedure in every form of venereal disease. Oftentimes in so doing a hint of trouble is obtained sooner than otherwise might not be suspected. This is frequently the case in blenorrhoea accompanied by chancre of the

urethra. After examination for bubo has been made by the scrutiny of the sore should follow. The lesion should be frequently exposed and cleansed of all secretions. If more then one sore is present, each should receive the same careful scrutiny. One need not hesitate to handle the chancre between the finger and thumb if the skin covering these parts be intact and the hands be washed immediately afterwards.

SECONDARY STAGE.

The inspection of the body surface comes next. This should be done in a clear, strong light, and the search for signs of the disease should be thorough and complete. Syphilodermata usually appear first over the anterior surface of the chest and abdomen, but they may arise elsewhere before developing in these regions. In examining the body note should be made of scars and relics of former trouble. Of special value are cicatrices in the groins as furnishing evidence of previous venereal disease. In the case of females greater delicacy must be exercised in making such examination. Women are apt to inspect the surface of their bodies with greater care and frequency than men, and their statements with reference to any eruption can be given fuller belief. Confirmation, however, should always be sought, and this can usually be accomplished by exposure of a portion of the body only at a time. Usually women will submit the part affected to inspection without much objection. In general, it should be remembered that, in distinguishing early syphilides from other eruptions, the syphilitic lesions are usually symmetrical in development, extensive in distribution, not apt to be the seat of subjective sensations, and are usually accompanied by mucous patches in the mouth and throat, by loss of hair, and by other symptoms of the constitutional disease. The erythematous syphilide is to be distinguished from the eruptions appearing in the eruptive fevers by its deeper colour, by its indolent character, by the involvement of the palms and soles, and by the absence of catarrhal discharge. If fever is present, it seldom rises as high in syphilis as in the exanthemata, and is apt to persist for a longer time. In syphilis relics of the initial lesion can usually be found or a history of the chancre's recent existence elicited. Osteocopic pains, sore-throat, mucous patches in the mouth, and alopecia are usually present. Erythematous eczema is usually less extensive in its involvement of the skin, and is productive of intense itching, while the lesions of syphilis give rise to no discomfort. In eczema the colour is brighter red to a greater degree, and moisture of the surface appears sooner or later. In tinea versicolor the patches are tawny in colour, and are found most frequently on the surface of the chest. The microscope shows the characteristic fungus. Drug eruptions are accompanied by a marked degree of discomfort, and appear in unusual sites and forms. It is usually possible to obtain a history of some ingested medicament. Papular syphilides are easily distinguished from papules occurring in other diseases by their peculiar forms and distinctive groupings. Papules in eczema are frequently

surmounted by a minute vesicle or covered by a blood-crust indicative the scratching by which relief is sought from the torturing pruritus. On the hands and feet syphilis confines its attacks to the palmar and plantar regions, while eczema involves both the anterior and the posterior surfaces. Ringworm can be distinguished by the microscope, the tricophyton being readily discoverable. In psoriasis the glistening and pearly-white scales surmounting the lesions and the chronic sluggish action of the process are distinguishing features. The pustular syphilides must not be confounded with the lesions of acne, smallpox, or the eruptions produced by the ingestion of potassium iodide or potassium bromide. In acne the evident involvement and limitation of the process to the sebaceous glands at once determines the nature of the affection. Comedones also are nearly always found mingled with the pustules. The fever and severe constitutional symptoms at once exclude syphilis. Knowledge that the bromide and iodide compounds have been ingested is usually sufficient to establish a diagnosis in the case of bromide or iodide acne. Syphilitic pustules present a well-marked areola, while nearly always ulcerative lesions are observed.

TERTIARY STAGE.

The diagnosis of the tertiary stage may be easy or the reverse. No single symptom should be relied upon, but all should be weighed and considered from every aspect of the case, We must mainly rely upon the history, the typical grouping, the sluggish action, and the destructive course of the lesions. Tertiary syphilitic affections present several characteristic features, some of which are pathognomonic. Nodes on the superficial bones, accompanied by nocturnal exacerbations of pain, and serpiginous ulcers are very distinctive. The involvement of the third cranial nerve should at once arouse a suspicion of a syphilitic disease. Hemiplegia, occurring in a comparatively young person without a definite cause, is suggestive of syphilis, more especially if a gradual onset is observed. Uniform enlargement of the testicle, without involvement of the epididymis, and stricture of the rectum in females, are probably syphilitic in origin, as also is epilepsy occurring for the first time in adult life. Any partial paralysis, and any irregular nervous symptoms, should lead to a careful inquiry for the presence of syphilis. In addition to these, the prodromal symptoms of nervous syphilis, - which are pain, impairment of the health and mental condition, and fugitive nervous phenomena, - the irregular course and involvement of cerebral lesions, the age of the patient, - which generally precludes all other causes of nervous affections, - and the examination of the cerebrospinal fluid for lymphocytosis may prove of great diagnostic service. The history of the case is of great importance. The patient must be thoroughly and tactfully questioned as to his past life; due stress must be laid upon the possibility of exposure to syphilis, all denials being received with suspicion. The body must then be carefully and thoroughly examined for any cicatrix that might have resulted from a chancre. The presence of scar on the penile organ is fairly reliable evidence of syphilis, but its absence

is by no means proof-positive of the absence of the disease. The groins should be thoroughly overhauled for scars; for as syphilitic buboes are not infrequently inflammatory in cases of mixed infections, cicatrices in this region are not so uncommon as some would suppose. Scars may also be found in other parts of the body, and the tibiae may present the characteristic sabre shape. In the absence of suggestive lesions the therapeutic test should be employed, and the serum reaction might with advantage by employed.

DIFFERENTIAL DIAGNOSIS.

Syphilis is peculiar in that it may simulate almost every conceivable disease. In this respect it is of the most protean sort. Therefore, the differential diagnosis concerns, as it were, the whole range of nosology; but in view of what has already been said under respective headings, it will suffice merely to run over a few of the more important points in connection with the simulating affections, such as tuberculosis, cancer, the eruptive fevers, chancroid, Vincent's angina, and cutaneous and nervous affections; yaws, smallpox, influenza, typhoid fever, scarlet fever, and measles are by no means uncommon causes of error. In the case of yaws the spirochaete pallida is absent, as are loss of hair, internal lesions, and stages. It is never inherited, and it confers no immunity from syphilis. The skin alone is affected, and the eruption is not polymorphous. The affection is confined to the tropics, whereas syphilis may be found in any part of the world. When fever is present along with a vesicular or pustular eruption, it is difficult to distinguish between smallpox and syphilis. In smallpox the course is more rapid, the headache is more intense and not subject to nocturnal exacerbations, and the spironema pallida cannot be found. The history of the case excludes syphilis. Typhoid fever may easily be mistaken for syphilis at first, that is, when fever and a scanty and discrete papular eruption are observed. The demonstration of the typhoid bacillus, the Widal reaction, leucopania, and the history of the case should clear up the mooted point. Sometimes cases of syphilis are diagnosed as influenza, when the latter is epidemic and when headache and backache and a rise of temperature are the prominent features. But none of the characteristic phenomena of syphilis are observed. Measles and scarlet fever are sometimes closely simulated by syphilis, when the roseola assumes a morbilliform or scarlatiniform type and also affects the throat and eyes. But they are more active and rapid, present no similarities with syphilis, and do not present the spirochaete pallida. The history is also distinctive. Malarial fever bears a resemblance sometimes to syphilis, but it has a special parasite and is prevalent mainly in special parts of the world.

REGIONAL DIAGNOSIS.

PENIS.

The initial sclerosis of syphilis or chancre requires differentiation from a number of conditions; but the discovery of the specific microorganism makes this

a matter of comparative ease instead of hypothesis as formerly used to be the case. The situation of the chancre varies, and so also do the various affections which call for differentiation from it. In general, the chancre has to be differentiated from chancroid, herpes, scabies, epithelioma, gumma, furuncle, ulcers due to tubercle and traumatism, eczema, and Vincent's angina. Soft chancre or chancroid has not an incubation period like that of hard chancre, and it is not accompanied by an inflammatory bubo. It is multiple, has a purulent discharge, and is painful. The adenitis is not indolent or indurated, and scrapings do not show the spirochaete pallida. Herpes is characterised by a group of vesicles to start with, and has no incubation period. It is of shorter duration, and there is no specific microorganismal cause. Burning and itching are marked features, and there is no induration and adenitis of a syphilitic character. It must not be forgotten, however, that herpes may be a coincident of the initial syphilitic sclerosis. Scabies on the penis, especially on the glans, must be diagnosed from syphilis in a few cases. In scabies there is no incubation period and no adenitis. Itching is present, and other parts of the body are similarly affected. There is usually a history of others being similarly affected. The spirochaete pallida cannot be demonstrated. Not infrequently the coexistence of scabies and hard chancre is observed. Epithelioma may simulate chancre in any situation. The absence of the spirochaete pallida, the examination of the tissue by means of the microscope, the lateness and chararacter of the adenitis, and the fact that no syphilodermata develop should determine the diagnostic doubt. The course of the lesion, and the fact that it bleeds easily, are important; while the age of the patient is not distinctive, as hard chancre may be seen at any period of the patient's life. A gumma of the penis, especially in the site of the old chancre, is not rarely mistaken for the initial lesion, and may account for some cases of reinfection. The fact that there is no incubation period, no adenitis, and no spironema pallida should determine the disease. A furuncle of the labia may simulate a chancre in some cases, and is diagnosed by the pain, the absence of the specific microorganism and of the indurated glands, and the course of the disease. Vincent's angina sometimes presents features not unlike those of chancre, but it is much more sensitive, and is due to a different cause. Chancre of the TONGUE is not unlike a tuberculous ulcer, and is diagnosed from it by the character of the adenitis, the sensitiveness, the microogranism, and the rarity of the latter. Chancre of the BREAST has to be distinguished from eczema. Paget's disease, Epithelioma, and fissured nipple; and this is done by the demonstration of the spirochaete pallida, the histological characteristics, and the adenopathy.

SKIN.

Loss of hair due to syphilis is diagnosed from alopecia areata by the patches being smaller, more numerous, more irregular, and by an absence of atrophy

from the skin. Roseola may be confounded with measles, scarlatina, simple roseola, drug eruptions, and rheumatic erythema. The fever, the acute course, the history, and general symptoms distinguish it from measles and scarlatina. Simple roseola is seasonal, usually attacks the face, itches, and not infrequently has febrile symptoms. Drug eruptions are more sudden in onset, more rapid in their course, and are cured by the abandonment of the medicament concerned. Rheumatic erythema is associated with rheumatism, and is present in the neighbourhood of joints. The marbling due to exposure to intense cold can scarcely be mistaken for syphilitic erythema. Pigmentary syphilides have no real leucoderma, and do not affect the hairs; they have the characteristic reticulum. These points distinguish it from vitiligo. Addison's disease affects the mucous membranes, while pigmentary syphilide does not. The papular syphilide, by its scantiness and situation, sometimes simulates the rose-spots of typhoid fever, and it has to be distinguished by the Widal reaction, the absence of leucopenia, and the characteristics of the syphilodermata. Syphilitic psoriasis differs from ordinary psoriasis by the scales being thinner and less adherent, the colour being darker, the absence of bleeding when the scales are removed, and the fact that it often affects the palms and soles. Lichen planus is diagnosed from the lichenoid syphilide by the presence of itching, the papules being less circular, the collateral evidence, and the therapeutic test. Herpetiform syphilides have not the colour and rapid development of ordinary herpes, and there is an irregular dissemination of the lesions observed. Acneform syphilide is less polymorphous, of a darker colour, less extensive, more acute, and more transitory than acne vulgaris, and it has no comedones. Smallpox is diagnosed from varioloid syphilide by the sudden onset of fever with headache and backache, the course of the eruption, and the absence of other signs of syphilis. It is very important to guard against sending a case of syphilis to the smallpox hospital, which has in not a few cases been done. Syphilitic ecthyma can only be distinguished from ordinary ecthyma by the absence of the signs and symptoms of inflammation. Palmar syphilides must be carefully differentiated from palmar eczema. The latter is nearly always bilateral, while the syphilitic condition is usually unilateral, has a soft base, is not limited to the palm, generally affects the whole palm, and is not curable with specific medicaments. Syphilitic impetigo has scabs of a yellower colour, and is more confluent and less indolent than impetigo contagiosa. The tertiary syphilides may be mistaken for lupus and tuberculosis. Lupus runs a more chronic course, is grouped in an irregular manner, has a lighter colour, and has the characteristic apple-jelly nodules at its margin. Other signs of tubercle must be looked for, and the therapeutic test applied if necessary. The histological, bacteriological, and inoculation tests are diagnostic. Tuberculous ulceration has a thin, soft border, a light areola, and an irregular and superficial, raw-looking base. The tests for lupus as already outlined must be

utilised. The gummatous ulcer usually affects the upper part of the leg, is more or less circular in form, is often multiple, has sharp and deep edges, and is usually coexistent with other syphilitic lesions; a varicose ulcer has none of these characteristics. Gummata differ from boils, carbuncles, etc., in their slow and painless evolution, as well as in the absence of concomitant inflammatory phenomena. Cancer differs from a gumma in the presence of pain and the involvement of the lymphatic glands. Syphilis of the external genitals has sometimes to be diagnosed from other lesions. Scabies has the characteristic nocturnal itching as its most important feature, and is not of a coppery colour. The acarus may be found on examination, and thus dispel all doubt. Herpes is painful and pruriginous, while the syphilide is not. Psoriasis and lichen planus have the distinctive characteristics already outlined. Soft chancre contains its special causative microorganism in the purulent discharge, and presents the above-mentioned general features.

EYE.

Syphilitic iritis must be carefully distinguished from rheumatic iritis, which is always associated with the casual disease, is never punctate, is more rapid in its course, and is unaccompanied by condylomata or other specific signs.

NERVOUS SYSTEM.

The various diagnostic points have been already outlined; but we may here specially note that essential epilepsy differs from syphilitic epilepsy in that it has an initial cry, is usually accompanied by loss of consciousness, occurs in young people, and is not attended by other central lesions so soon after its onset as syphilis. Syphilitic hemiplegia is distinguished from that due to other causes by the following points: It usually occurs in younger people, though it may be seen at any age. Prodromal symptoms, such as headache and transient paralysis, are commonly observed. There is a much slower onset, there is no lapse into unconsciousness, and the evolution of the affection is slow, progressive, and incomplete.

CIRCULATORY SYSTEM.

The various syphilitic affections of the circulatory system can be diagnosed by the associated symptoms in connection with the general history of the case.

RESPIRATORY SYSTEM.

NOSE.

Lupus is the only condition that may cause confusion in this part. But the affection is usually found in association with other tuberculous symptoms, is of slower course, there are characteristic pathological changes as already outlined, and the history of the case is different.

Cancer does not respond to the therapeutic test, and an absence of crusts is observed.

NASOPHARYNX.

Lupus here can be differentiated as in the case of the nose.

LARYNX.

Both tubercle and cancer may be simulated by tertiary syphilitic affections of this part. The first-mentioned affection is recognised by the multiplicity of its lesions, its superficial location, the presence of other tuberculous symptoms, the discovery of the specific microorganism, the pain experienced, and the futility of the therapeutic test. Furthermore tuberculous lesions are generally situated on the vocal cords, whilst syphilis has for its preferential location the epiglottis; tubercular lesions are moist and pink, whereas syphilitic lesions are dry and of a darker hue; syphilitic ulcerations are deeper and more destructive, and the surrounding tissue is of a paler tint. Cancer gives rise to great pain, there is a foetid odour of the breath, the evolution of the disease is more rapid, haemorrhage is common, and the histological changes are of a characteristic sort.

LUNGS.

Syphilitic pulmonary troubles are apt to be mistaken for phthisis pulmonalis. But the tubercle bacillus will be found in the sputum in phthisis and not in syphilis, unless the two affections are present together. There are also in tuberculosis diarrhoea, night-sweats, hectic fever, and other characteristic phenomena.

ALIMENTARY TRACT.

MOUTH.

Mercurial stomatitis sometimes requires recognition; the ulcer resulting from the administration of mercury is rarely located upon the fauces, upon the dorsum of the tongue, or at the angle of the lips where syphilitic ulceration is common. It is generally discovered behind the last molar tooth. The presence of other signs of mercurial stomatitis, such as salivation, foetid breath, red and spongy gums, and the fact that a cure is effected by abandonment of the drug, will eliminate syphilis from the diagnosis. Diphtheria is recognised by the presence of the specific bacillus of that disease, as well as by the greater severity of the constitutional phenomena and the general history of the case. Aphthous erosions are smaller and more painful than those due to syphilis; but in some cases the differential diagnosis is well nigh impossible at first sight. Herpes is characterised by the frequency of a group of lesions, the absence of associated syphilitic phenomena, the minuteness of individual lesions, the collerette of epithelial débris, and the behaviour under the therapeutic test. Vincent's angina is caused by a different germ, does not react to mercury or iodide of potassium, and is cured by the application of tincture of iodine. Tertiary syphilitic affections of the tongue may be confused with a primary chancre, tubercle, and cancer. The primary chancre is accompanied by characteristic adenitis, and shows the specific microorganism, whilst tertiary syphilitic lesions do

not. Tuberculous ulceration is more painful and superficial than the gummatous ulcer, and is less excavated and more ragged; the tuberculous ulcer may develop on the under surface of the tongue, where a gumma is never seen. Cancer occurs generally in males over forty-five years of age, though this is not absolutely diagnostic as syphilitic lesions of this part may be seen at almost any age, though not usually. Cancer is usually single, whereas syphilitic lesions may be multiple. The glands are enlarged and the pain is severe in cancerous conditions, while both are wanting in syphilis. Cancer is rare upon the dorsum of the organ, whereas syphilis is common; the affection bleeds readily, and is a fungating ulcer with an extremely hard base. The histological features are distinctive, and mercury and iodide of potassium are without effect.

PALATE.

Gumma of the palate may break down and ulcerate, and so simulate a tuberculous ulcer; but the latter is more painful, never perforates the palate, has a concomitant adenopathy and other tuberculous symptoms, may present the tubercle bacillus, and does not respond to the therapeutic test.

TONSIL.

Chancres and gummata of the tonsils require differentiation by the application of the symptomatology as already described. Cancer of this part is harder, more painful, less deep, and of slower evolution than a gumma.

INTESTINES.

Gastric and intestinal syphilitic lesions may require differentiation from gastric ulcer, tubercle, and cancer. The associated symptoms of syphilis and the response to the therapeutic test will effect this.

LIVER.

Cancer and cirrhosis of the liver may present symptoms not unlike those of syphilitic hepatitis. Gummata are of slower evolution than cancer, and they less often give rise to icterus and ascites. Hepatic cirrhosis is more chronic in its course than syphilis, and does not respond to the therapeutic test. The history of the case, the presence of syphilitic scars, and the discovery of associated phenomena would distinguish between the two conditions.

MAMMARY GLAND.

Syphilitic lesions of the breast are sometimes confused with cancer and adenoma. The former affection is more painful than syphilis; it causes enlargement of the lymphatic glands, whilst syphilis does not, and the skin is involved. Gummatous ulcers are without fungation and adenopathy. Adenoma of the breast is more movable than syphilis. The therapeutic test is always of service.

TESTICLE.

Tubercle and cancer may simulate syphilitic orchitis. The first-mentioned commences in the epididymis, while

cancer and syphilis begin in the testicle itself. Cancer undergoes its evolution more rapidly than the other two. Syphilis does not involve the scrotum; cancer and tuberculosis ultimately do this. The pain is more severe in cancer and tubercle than in syphilis, and tenderness is not a feature of syphilis and cancer, while it is of tubercle. The spermatic cord is seldom affected in syphilis, but not uncommonly in cancer and tubercle. The syphilitic testicle is harder and more uniform than that of cancer and tubercle. Cancer seldom affects both organs; syphilis often does. The glands are involved in cancer, but usually free in syphilis and tubercle. The cancerous testicle has fungating characteristics; suppuration and the production of fistulae are common in tubercle but rare in syphilis. Orchitis of traumatic origin is rapid in its onset, accompanied by severe pain and great swelling, and there is a history of an injury of some sort. Gonorrhoeal orchitis is known to be preceded by gonorrhoea, and there are changes in the epididymis and spermatic cord.

BONES.

Non-specific neoplasms, callus, suppurative osseous conditions, and tuberculosis may present symptoms not unlike those of bone syphilis. Callus and ordinary neoplasms can be eliminated by the history of the case and X-ray examination. Suppurative osseous conditions differ from syphilis in the degree of the pyrexia and leucocytosis, as well in the absence of nocturnal exacerbations of pain. Tuberculous epiphysial lesions have that location rather than one in the shafts of the bones. The pain in tubercle of the bones is not subject to nocturnal exacerbations and is ameliorated by traction, whereas in syphilis the contrary obtains.

JOINTS.

Tuberculous arthritis is the most important articular affection requiring differentiation in certain cases. It is more painful, more rapid in evolution, sooner destructive, and productive of a general thickening of the synovial membrane instead of the localised nodules of syphilis. In the latter condition there may be evidences of scars, the X-ray phenomena are different, and the response to specific medication is well-known. Rheumatoid arthritis presents the lipping of the edges of the bone, which is absent in syphilis; it is more chronic, causes grating, and results in greater deformity than does syphilis. The history of the case and the X-ray phenomena are entirely different. Associated syphilitic symptoms, the therapeutic test, and the general history of the illness will suffice for the elimination of tuberculous spondylitis.

LABORATORY DIAGNOSIS.

WASSERMANN'S SERUM REACTION.

A method of somewhat recent invention and of great value of that devised by Wassermann.But before entering fully into the technique thereof,it is advisable to devote some consideration to the subject of lipoids. This name was first applied by Overton to fatty substances which are present in all living cells,both animal and vegetable.There are three kinds of lipoids:first,nitrogen-free and phosphorus-free cholesterin,fatty acids and lipochromes;second,nitrogenous,but phosphorus-free, cerebrosides,and,third,phosphatides containing both nitrogen and phosphorus.Cholesterin,a lippid,was until within recent years considered an unimportant substance. Flexner and Noguchi have shown,by their experiments upon cobra venom,the importance of these bodies in connection with toxins.It has been demonstrated that the lipoid in the cells is doubly refractile on rotation of a Nicol's polarising prism.Munk,who observed the effect of the polarising prism on the lipoids,has also established the fact that these lipoid droplets,when present in a cell, are associated with destruction and decay of the latter and its nucleus.A large amount of lipoid substance means extensive cell-destruction,the lipoid resulting from the dissolution of the highly phosphorated nucleus and from the cell protoplasm.Levaditi experimentally showed that the spirochaete causes a proliferation of cells;and that then,when they invade these young nuclei-rich cells, they,by the action of some secretion or otherwise,cause a lysis of these embryonic cells,with consequent increase in lipoid material.These lipoids are normally found in the human body;so it is only when they are found in excessive numbers that we can ascribe anyspecific interpretation to them.The syphilitic virus,by inducing metabolic changes,has the power of setting free these lipoids in quantities which are seen in the serum and in the cerebrospinal liquid.Their presence has a bearing upon Wassermann's method of diagnosis by fixation of the complement.The method,though in general application limited by its complicated technique,is of great value in doubtful cases.Certain terms are used in connection with the test which it is necessary to explain. An antigen is something capable of inducing the production of an antibody on introduction into a livingbody - the object of this antibody being to neutralise or destroy it;and by virtue of it recovery most likely tacurs.We known that in the case of toxin and antitoxin this opposing action occurs within the body by a series of chemical changes.A somewhat more complex action obtains, however,in the case of cells or microbes,a third agent being required for the accomplishment of the union of antigen and antibody;this additional agent is calledthe complement.During the process of blending of antigen and antibody it becomes used up.The antigen produces an antibody to only the same variety of cell,and is therefore specific.On the other hand the complement ~~is~~ cannot be so regarded,for it is normally present in all fresh blood sera.Antibodies are stable and long-lasting;they can withstand exposure to a temperature as high as 60.C. On the contrary,the complement is killed in thirty minutes by that temperature,and perishes in a few days at room-temperature;its stability is therefore almost nil. Fisher compares antigen,antibody,and complement to a lock,a hand and a key respectively - any hand being able

to turn any key in its own lock,whilst the key can only turn in its own lock,and the key without the hand cannot turn in its own lock.The object of the Wassermann test if to find out if a given serum contains any syphilitic antibody when the antigen used is hepatic extract;then a haemolytic process is utilised for the determination of whether or not the complement has been used up in so doing.A small amount of complement can be absorbed separately by the specific antigen and antibody or any other antibody in a normal serum;but in stimulating the combined antigen-antibody a considerably greater amount of complement is used up before the specific antigen-destroying action can take place.Consequently,if one volume of complement is used up by two volumes of specific antigen,specific antibody or normal serum when acting on one another separately,making five volumes in all,- the combined specific antigen and antibody will absorb ten or more volumes of complement.When trying to detect the presence of a syphilitic antibody in the test serum it is necessary to add an excess of complement over the quantity that could be used up by specific antigen or normal serum.If there is no antibody present in the serum,the complement will remain free and produce haemolysis.In the Wassermann test we have therefore to deal with two antigens,two antibodies,and one complement - making five ingredients in all.The blood of the suspected individual is taken from the median basilic or other prominent vein by means of a sterilised needle,due asepsis being observed during the procedure.The blood is received into a sterile tube,and centrifuged after two hours;the clear serum is drawn off with a sterile pipette,and sealed upside small glass receptacles duly sterilised beforehand.The serum is placed in a water-bath at 60.C.and thereby decomplementised.The manufacture of the specific antigen is effected by chopping up and pounding a syphilitic liver from a foetus or infant, and taking therefrom a 10 per cent.alcoholic or 20 per cent.watery extract.Now and then during a period of twenty-four hours the emulsions are shaken up,then centrifuged,and the clear supernatent liquid collected and stored in an air-tight bottle,adding half a per-cent,of carbolic acid in the event of a watery extract being used.For the preparation of the haemolytic antibody the washed corpuscles of from 1 to 5 c.c.of fresh sheep's blood are injected into the auricular vein or peritoneum of a rabbit every four days,usually on three occasions: by which time the animal's serum,as a rule,contains an antibody of strong haemolytic action.Next 10 c.c.of blood are taken from the auricular vein;the serum is collected in small sterile phials,and in order to sterilise it,and destroy all the complement,the phials are heated to 60.C.for forty-five minutes on three successive days.For the preparation of the complement,the front of the thorax of an anaesthetised guinea-pig is lifted up,and the heart-blood is collected in a sterile pipette;after clotting it is centrifuged and the complement-containing serum is drawn off.For each serum to be examined and for the three controls,one small test-tube is needed.Experimenting,for instance,with seven sera,making altogether ten with the three controls,the most suitable quantities are 2.5 c.c.normal saline solution, .2 c.c. of antigen-containing hepatic extract,and .1 c.c.complement per tube.These should first be mixed in bulk instead

of separately in each test-tube,and then measured off into the testetube,to which .3 c.c.of the test serum is added,one serum to each tube.Thus we have but two pipette measurements instead of the four consequent on the separate addition to each tube of saline liver extracts, complement,and test serum.The next thing to be done is to prepare a dilution of normal saline of rabbit's serum or haemolytic antibody in such a way that,after a five minutes' incubation at 37.C.,1 c.c.of this dilution added to 1 c.c.of a 7.5 suspension of washed sheep's corpuscles will bring about solution of the latter.Then it is neceassy to mix together in bulk for each serum to be examined,and for the three controls,1 c,c.of 7.5 suspension of sheep's corpuscles and 1 c.c.of a decomplementised haemolytic antigen suitably diluted.The term"haemolytic system"is used to designate this mixture of haemolytic antigen and antibody.The ninety minutes required for the incubation of the tubes of hepatic extract,test serum and complement affords ample time for the estimation of the haemolytic power of the serum and for the accomplishment of the proper dilution and mixture of the diluted serum and the corpuscular suspension.Then the tubes are withdrawn from the incubator,and the 2 c.c.of haemolytic system(vide supra)are added to each tube.The tubes must next be shaken up and incubated until there occurs complete solution of the corpuslces in the control tubes carrying the saline solution and the normal serum.Only then may these two tubes be taken out of the incubator and examined.If this serum be from a syphilitic individual, it will contain a syphilitic antibody;the activation of the syphilitic antigen contained in the hepatic extract which has united with the syphilitic antibody in the serum of the patient will,during the first incubatory period,have been used up.Consequently,no complement will remain for the second incubation period when we add the haemolytic antibody and antigen;in these tubes no haemolysis can therefore occur.But should the patient's serum contain no syphilitic antibody,the complement will not be used up;it will activate the haemolytic system and give rise to a solution of the corpuscles.When there is no solution of the corpuscles a positive reaction is obtained.This method of diagnosis has been well received and yielded most important results;it ranks with Widal's test for enteric fever.Plant obtained a positive reaction in from 80 to 90 per cent.in undoubted cases of syphilis; almost invariably the cerebrospinal fluid in cases of general paralysis,and less often of ataxic,gave it.Hillier found the reaction more certain in cases which showed secondary lesions.Other observers report various findings;but we may take it that,generally speaking,the Wassermann serum reaction is forthcoming in about 80 per cent of the cases.Some report as high a percentage as 95,and affirm that only a trifling number of non-syphilitic cases show it;of the diseases which are said sometimes to give a positive reaction may be mentioned scarlet fever,trypanosomiasis,leprosy,and yaws,and perhaps pneumonia after the occurrence of the crisis.It never occurs in a healthy individual,and never in tuberculous or cancerous cases.All cases of hereditary syphilis,as a rule, give a positive reaction.For fourteen days after the first appearance of a chancre negative results are obtained;but after the lapse of that period three-fourths of the cases respond to the Wassermann test;90 per cent.

of secondary cases and some 75 per cent.of tertiary ones give a positive reaction;parasyphilitic tabes and general paralysis give respectively 50 and 90 per cent.We may take it,then,that this reaction,when positive,is of great diagnostic value;but a negative result is no proof of the absence of the disease,and we have seen that in other affections than syphilis a positive reaction may be obtained.It is said that the serum reactionsof syphilis and of general paralysis are not due to the intervention of antibody or syphilitic antigen,or to the specific germ of the disease.According to Neisser,Brück and Stern,the antigens are not identical with the living virus,and the influence of mercury or atoxyl is not exerted upon the antigen,but injures or destroys the spironema;they firmly maintain that the positive results to the Wassermann test obtained in tabes and general paralysis suggest the association of syphilis therewith. Most observers hold that a patient whose serum gives a positive reaction cannot be looked upon as free from syphilitic taint;further,that an isolated failure to obtain the reaction is no proof of the extinction of the disease,as this has occasionally temporarily obtained even in cases who have not received antisyphilitic medication.These negative phases,it should be remembered, are invariably of a transitory character in cases undoubtedly syphilitic.It is unfortunate that the Wassermann reaction,though of great service in secondary,tertiary,and hereditary syphilis,as well as in parasyphilitic conditions,cannot be taken advantage of to determine whether or not a newly-developed sore is syphilitic.Microscopical examination must then be employed.

Noguchi,who first drew attention to the importance of the lipoids,has devised a method similar to the above; it consists of boiling the cerebrospinal fluid with half a c.c.of a 10 per cent.solution of butyric acid,and then nearly neutralising with an alkali.In parasyphilitic cases a flocculent precipitate is obtained.

JUSTUS'S BLOOD TEST.

Justus says that the reaction of the blood to mercury is a test for syphilis,especially in doubtful cases,a single inunction with mercurial ointment producing a reduction in the haemoglobin in all untreated syphilitic cases,but being without effect in non-syphilitic persons.In this way a reduction of from 10 to 20 per cent.was obtained by our author,who adds that it also occurs after intravenous and subcutaneous injections,but never when mercury is taken internally. Jones(New York Med.Jour.,April 7,1900),Tucker(Philad. Med.Jour.,1902),and others have carefully gone into the alleged importance of this test.The first-mentioned writer says that he tried it in thirty-five syphilitic cases and eighteen control - fifty-three in all,the haemoglobin being estimated by the specific-gravity test.The syphilitic cases comprised seventeen cases of active syphilis not under the influence of specific medicaments, one case under treatment, two latent cases,and eight cases of chancre with adenitis.The control cases were individuals suffering from such affections as phthisis pulmonalis,typhoid fever,acute alcoholism,and all failed to respond to the test.Of the seventeen cases of active syphilis not under treatment,thirteen were responsive and four not.Three of the four negative cases had characteristic secondary eruptions

on their bodies at the time of examination.A negative result was obtained with the latent cases and the one being treated for the syphilitic taint.The test,then,is of doubtful value;it secures a response in non-syphilitic affections(herpes,tuberculosis,etc.),and fails in just those cases where it should not - latent cases and chancres,for instance.

INOCULATION DIAGNOSIS.

The inoculation of monkeys has been proposed for the diagnosis of syphilis.The method is reliable,it is true,but obviously impracticable owing to the scarcity of these animals here - not to mention expense and other unfavourable circumstances.The proposed inoculation of mankind may be dismissed by a mere mention of the fact,admitting,of course,that the procedure would give most reliable results.

HISTOLOGICAL DIAGNOSIS.

This is especially useful in cases of newly-formed sores which may or may not be syphilitic,and in which,as we have seen the Wassermann test is useless. The method is simple,rapid,and certain and consists in the demonstration of the spirochaete pallida in scrapings from the lesion.Two forms of microscope may be used - either the ultra or the oil immersion. The ultra-microscope is of French invention,and is now considered the most certain appliance for determining the syphilitic nature of a cutaneous or mucous-membrane lesion,failure occurring in a mere fraction of a per cent.The instrument consists of the usual apparatus modified so that all light rays from the mirror,with the exception of those at the periphery,are cut off by means of a disc of black enamel painted on the under surface of the condenser. Specially devised lenses deflect the rays passing through the clear periphery in such a way that they obliquely converge on the specimen under examination - the latter appearing as a bright refractive body on a dark background.Thus it becomes possible to see clearly very transparent objects which would be invisible under the method of direct illumination.The method of direct examination consists of the use of the oil-immersion lens, which is,of course,well known through having been many years in vogue.In either way the characteristics of the specific parasite are appreciated;they have already been described.

HEREDITARY SYPHILIS.

The difference between acquired and congenital syphilis is,we have seen,apparent rather than real.The primary stage is,of course,missing,and on any theory of the essential nature of syphilis this is readily understood.The chancre is naturally in the case of the hereditary disease missing,in the acquired disease present. The secondary stage,characterised in the acquired taint chiefly by lymphatic engorgement and symmetrical,widely-spread,polymorphic cutaneous and mucous eruptions,and pathologically by a marked tendency to the proliferation of certain new small round nucleated cells,upon the presence of which depend all the manifestations of the disease,is in inherited syphilis strictly analogous. Eruptions of the same character make their appearance, differing only in minor points,as in a greater tendency to become moist or ulcerated,due to the more delicate texture of the infantile skin.To the same cause must be

assigned the macroscopic peculiarities of the only syphiloderm peculiar to infantile syphilis - pemphigus - which has been shown, however, to have a papular base, and in that way to conform to all the other efflorescences of the secondary stage of the disease. The lymphatic engorgement either exists in the infant as in the adult or has its analogue in the enlargement of the spleen and liver - especially the former, which is almost as constant a phenomenon as in general glandular enlargement in acquired syphilis. The same pathological changes occur, the same infiltration of the cells producing, according to their situation, papular, pustular, or mucous patches, or inflammation of such structures as the retina, the iris, or the choroidal membrane. The tertiary stage, except in the fact that its phenomena may appear unusually early and may be commingled with those of the secondary period, does not widely differ in the hereditary form from that of the acquired disease. It affects the same tissues, results in the same pathological formations, and is preceded by the same period of latency or quiescence of variable duration. There is no reliable evidence to show that in this stage inherited syphilis is either contagious or transmissible - another point of close resemblance between the two varieties of the disease. Consequently, in dealing with the subject of diagnosis, we have a reliable guide in the fact that the disease conforms in most respects to the general laws of acquired syphilis, and that what we know about the one will aid in the recognition of the other. A history of syphilis in either parent is important just in proportion to the shortness of the interval between the time of infection and the date of conception. In other words, the shorter that interval the more likely that the child will have syphilis, that it will have it in a severe or fatal form. If the mother has been syphilitic and the father healthy, which is rare, it is perhaps more likely that the child will be diseased than when the reverse is the case. If both parents were syphilitic at or before the time of conception, the probability that the disease will be transmitted, and in a severe form, is much increased. There is no evidence to show that inheritance from one parent results in a graver form of syphilis than when it is derived from the other. A history of abortion or miscarriage on the part of the mother should have weight in the determination of any given case, and if such accidents have been frequent their diagnostic importance is greatly increased. The loss of elder brothers or sisters and the causes of death, with the precedent symptoms, should be carefully inquired into. The nearer either of these occurrences - abortion or death of elder children, if there is a fair presumption that they were due to syphilis - has been to the birth of the patient in question, the greater the probability that the latter is syphilitic. The foetus aborted or miscarried will have the most characteristic symptoms of the disease upon the skin. Maceration and elevation of the epidermis into bullae are in themselves hardly characteristic, though they may, especially the latter, be regarded as suspicious. If the cutaneous lesions are, however, distinctly papular or pustular or ulcerative, or if the bullae have all the characteristics of syphilitic pemphigus, the diagnosis of inherited syphilis is a matter of certainty. It is probable that abortions of early occurrence

are less rare than statistics indicate,but are often unsuspected.It is impossible to demonstrate the existence of syphilitic lesions in foetuses expelled during the first months of pregnancy.Later,the signs which have the greatest value are the lesions of the epiphyses of the long bones.When the foetus has nearly arrived at full term,and is not macerated,visceral and cutaneous lesions may be observed.According to Mewis,the skin eruptions cannot be seen before the eighth month,and are only recognisable when death has been very recent or in the case of live-births.Pulmonary lesions may be determined at the end of the sixth month.Those of the pancreas are encountered in about half the foetuses which perish a little before or a little after birth.The lesions of the liver,the spleen,and the bones may be recognised even in macerated foetuses,this frequency increasing from month to month.The most distinctive symptom,one which may be considered as pathognomonic,is,however,the inflammation of the diaphyso-epiphyseal articulations,with or without their disjunction.Distinct enlargement of the spleen or liver,and arachnitis,with hydrocephalus,are valuable diagnostic points,and the not infrequent presence of gummata would obviously convert a doubt into a certainty.The syphilitic infant at birth may be small,stunted, emaciated,weazened,senile in appearance;this would properly give rise to suspicion,but may be associated with any disorder of nutrition on the part of child or mother. It may also show cutaneous or mucous eruptions evidently specific in character.The most common of these at this early date is the bullous eruption affecting the palms and soles,sometimes distributed over the whole body,and, as it indicates a feeble resistance of the tissues to the tendency to exudation and cell-growth,is usually a precursor of an early and fatal termination.In any event, marked symptoms at time of birth render the change of the infant's surviving very slight.It is quite common, however,perhaps more so,for the subject of congenital syphilis to give no evidence of the disease at birth,but even to appear healthy and well nourished.In such cases the first symptoms of the disease appear,on an average, in from six weeks to two or three months,and consist principally of coryza or snuffles,hoarseness of voice, and syphilodermata.The latter may be macular,papular, pustular,or bullous.They are usually polymorphous,irregular in shape,dark coppery-red in colour,with sometimes a glazed or crusted,but oftener a moist or ulcerating, surface,with a strong tendency to coalesce into large patches,or to form irregular serpiginous ulcers,or to take on hypertrophic growth and develop into condylomata. Eruptions which are squamous and are situated about the mouth and chin and on the body,the legs,or the soles of the feet,though exceptional,are of more value than those on the buttocks,where the results of irritation from urine and faeces may closely simulate syphilodermata. Mucous patches on the tongue,cheeks,tonsils,and pharynx are uncommon,often extending to the larynx,increasing the hoarseness,and to the nasal cavities,aggravating the snuffles.Both of these occurrences,by interfering with the respiration of the infant and rendering its respiration interrupted and insufficient,greatly add to the gravity of the case.Enlargement of the spleen is common, enlargement of the liver is not so common,and iritis is rare at this stage in association with the syphilides.

When the efflorescence commences to take its departure, there may be developed the specific inflammation at the junction of the epiphyses and diaphyses which produces a swelling of the long bones near their ends.The infant will be seen to cry a little when,for example,the wrist or elbow on one side is washed,and not to use these joints as much as the corresponding ones on the other side.The parts are not hot,only slightly tender,and as yet there is but little swelling.Later,the droop and disuse of the affected limb become more conspicuous and simulate infantile paralysis.There is,however,no wasting, no alteration of faradic excitability,so that the term pseudo-paralysis,in view of the additional fact that there is no loss of power,is an appropriate one.In a week or so similar symptoms will occur in the bone on the opposite side,and finally the ends of all the long bones may be affected;ordinarily the elbows,wrists, knees,and shoulders are the articulations involved.Suppuration is rare,disjunction of the of the epiphysis from the diaphysis common.Similar changes may occur in the cranial bones and give rise to what has been called the natiform skull.During the first year it is very common for syphilitic children to develop a number of lenticular swellings on the cranium,which appear symmetrically around the anterior fontanelle,but at a little distance from it,that is,one on each frontal and one on each parietal bone.These are said to be bossed.They are at first circumscribed,and in a child nine or ten months old often measure three-quarters of an inch to an inch in diameter.They are at first circular,afterwards more irregular,and finally tend to organise,becoming diffused and massive and causing a permanent thickening of the skull.These phenomena are the prominent ones occurring during the first six or eight or twelve months of life. If they do not manifest themselves before the eighth month,it is highly probable that,then in a case with a syphilitic parental history,the child will either escape altogether or that the secondary stage has been very slight and altogether intrauterine and unattended with noticeable phenomena.If during this first year the child's cachexia is marked,if there are any intercurrent diseases,if the symptoms show themselves early,if the nasal or laryngeal affection is severe,if the eruptions are markedly nullar or pustular or ulcerative,if the enlargement of the spleen is great or the osseous lesions early or grave,and if especially there is any intermingling of the gummata,nodes,or other tertiary phenomena of the disease,the child will probably die.The diagnosis of congenital syphilis from adolescence on through adult life will depend on the following points:First,of course,the history of parental or of infantile syphilis, or of both.Then a group of physical and physiognomonical peculiarities,which are not definitely characteristic, and are of little value when taken separately,but are of considerable importance when all or a majority are present in any given case.These are low stature or puny development proportionate to the severity of the intrauterine and infantile symptoms;a pasty,leaden,or earthy complexion,a relic of previous syphilodermata,probably also a result of malnutrition;a prominent forehead, bulging in the middle line at and within the frontal eminience,and due either to thickening of the skull or to a previous arachnitis and hydrocephalus before the

ossification of the fontanelles;a flat,sunken bridge of the nose,due to the coryza of infancy extending to the periosteum of the delicate nasal bones,and either interfering with their nutrition or partially destroying them; dryness and thinness of the hair,with brittleness and splitting of the nails;synechiae and dulness of the iris, which is rare;ulcerations of the hard palate;and periosteal thickenings or enlargements of the shafts of the long bones near their ends,or slight angular deformity, results of the osteochondritis of early life.It not infrequently happens that those of long experience in the observation of the disease will at once diagnose syphilis after having simply seen the child's face,although the peculiar hue is more easily recognised than described.The countenance looks as if it had been lightly smeared with coffee-grounds or a very dilute aqueous solution of soot.There is neither the pallor,the icteric hue,nor the straw-yellow tinge if skin seen in other cachectic affections;the tinge is not nearly so deep,but it is almost like that of the countenance of a recently-delivered woman,and either does not extend at all,or only partially,to the rest of the body.Syphilis is perhaps the only affection which gives the child's skin this peculiar tint;and,when well-marked its diagnostic value should not be disregarded.Coles(Proc.Path.Soc.,Vol.vii., p.5)reports several cases of congenital syphilis in which there was wide separation of the jaws in the median line.In one family one member had typical teeth and wide separation;three others had the same separation,but not the characteristic teeth.It was suggested that in such cases the teeth were in size far below the average, and that the condition was that often observed where the jaws are in development in excess of the teeth which they contain.Atkinson(Am.Jour.Med.Sci.,Vol.lxxvii.,p.71) describes some interesting cases of this lesion in late hereditary syphilis,and attributes to it considerable diagnostic importance.But of much greater significance from a diagnostic standpoint are the following symptoms, which are mentioned in the order of their importance, any one of the first three being almost or quite conclusive:(1)Dwarfed permanent median upper incisors,broader at the top than at the cutting edge,which is crescentically notched,separated by an undue interval and converging towards one another.(2)Evidence of past or present keratitis(a dusky and thin sclerotic in the ciliary region and slight clouds here and there in the corneal substance,there being no scars on its surface)or of disseminated choroiditis;patches of absorption,especially around the periphery.(3)A radiating series of narrow cicatricial scars extending right across the mucous membrane of the lip,or a network of linear cicatrices on the upper lip and around the nostrils,as well as at the corners of the mouth and on the lower lip.(4)Periosteal nodes on one or many of the long bones;sudden, symmetrical,and complete deafness,without otorrhoea and unattended by pain or other subjective symptoms.In a few instances there has been noticed an arrest of sexual development;in one of Hughlings Jackson's cases there was such an entire absence of all sexual characteristics that it was supposed that the ovaries had been destroyed by syphilitic inflammation in infancy.The value of the Wassermann reaction in early congenital syphilis has already been insisted upon.

DIFFERENTIAL DIAGNOSIS.

In every case the differential diagnosis will depend upon the securement of an accurate history of parental syphilis and upon the appearance of the child. When the infant is born with well-developed syphilitic lesions of the skin, articulations, bones, etc., the diagnosis is readily made; but many children present obscure or slight symptoms and lesions which may be confounded with other affections. Others, again, show no symptoms of any kind until two or three months after birth, and such children may appear in every respect sound and well. The mucous patches may be confounded with stomatitis. In simple stomatitis the mucous patches cover a larger surface and occur more often in the sulcus between the gum and buccal mucous membrane. The exudate is serous, and vesicles form which are not present in the syphilitic patch. In parasitic stomatitis there are far more inflammatory action and swelling than in the syphilitic lesion. The syphilitic lesions of the bones can be distinguished from rickets by the fact that in the latter there are symmetrical enlargement of the epiphyses, slow closure of the fontanelles, bending of the shafts of long bones, and a lack of involvement of other structures. Rachitic changes in the bones are rare in the first half-year, and in syphilis there are generally cutaneous and other symptoms. Besides, there is the history of the case, which will throw light upon the condition if thoroughly inquired into, and the Wassermann test may in early cases be tried.

PROGNOSIS.

ACQUIRED SYPHILIS.

Ere now it will have become apparent that syphilis is by no means a trivial disease,though,in view of the brilliant results of present-day treatment,perhaps so by some considered;it is true that it is now in itself a much milder affection than in the Middle Ages,and that the outlook is better all round.The type of the malady also influences the prognosis;according as the type of syphilis is malignant or benign,so is the prognosis.Idiosyncrasy is not without influence.The patient may not be able to take mercury in any form,and so not be amenable to treatment;such cases are,however,rare.Another form of idiosyncrasy concerns the patient's susceptibility to the disease.Thus,two men may contract syphilis from the same woman,under exactly the same conditions, and one may be much worse than the other,although they undergo the same treatment.As patients not infrequently pay no heed to warnings to this or that effect,the prognosis is not always favourable;carelessness in carrying out the treatment and indulgeence in alcohol and tobacco tend to undo all good effected.Cases seen early and properly cared for nearly always terminate in recovery,provided instruction be by the patient faithfully observed during a considerable period.The affection is seldom in itself the cause of death,except in hereditary cases.When patients die it is usually from exhaustion consequent on the severity of the acute stage,or to loss of blood following ulceration.If all the cases in which syphilis,by causing diseases of the brain,circulatory system,liver and kidneys,becomes remotely the cause of death were attributed to their true source,the list of fatalities from this affection would in many instances be enormous.On the whole,all estimates of the proportion of deaths among those affected with syphilis are untrustworthy.No propoer idea of the mortality can be obtained from the statistics of the venereal wards of hospitals;for only seldom are fatal cases of syphilis seen therein.In all cases a correct history of the illness should be obtained before deciding as to the patient's chances of recovery;otherwise we must be content with the conditions as clinically observed.Not a few syphilitics are untruthful and desirous of concealing as much as possible from the madical attendant.Regarding the outlook in individual cases,we have already seen that there are both mild and severe forms.The patient's life is often in imminent danger in these latter forms, in whichthe first eruption is not infrequently pustular and in which the chancre itself may take on a gangrenous tendency.The intensity of the present and future manifestations will be in proportion to the intensity of the infection,the resistance of the patient,and the amount of treatment,as well as invariably proportionate to the duration of the disease.The general condition of the patient must not be overlooked.If it bears a certain relation to the local symptoms,the prognosis is more favourable than when great weakness,anaemia and emaciation

are seen in conjunction with unimportant local manifestations.This is especially true as regards the secondary stage of the malady.In the tertiary period a well-marked cachexia may exist with limited affections of the skin or bones,and in a short time,under specific remedies,the local signs may disappear and the patient ultimately regain the usual appearances of health.But there must be no visceral lesions,especially changes in the liver andkidneys,and,above all,no interstitial lesions. While albuminuria may be relieved,and even cured,in some cases dysenteric symptoms,when specific,almost invariably lead to a speedy fatality.Great importance must also be attached to the constitution of the patient;one can never be sure that the attack will be light.The interval between the infection and the appearance of the chancre, the time when the induration is appreciable,the extent of the hardness,and all similar signs are worthless and meaningless,of no prognostic value - no indication of the future condition.Spontaneous cure after the appearance of the chancre has been reported;but abortive syphilis must be regarded with suspicion,because the disease, however mild and easily relieved,brings out every weakness;it encourages the development of tuberculosis,and favours the occurrence of almost every diathetic abnormality.The prognostic significance of the climate of the patient's residence has been made rather too much of in the past.But there seems little doubt that syphilitic attacks in Europeans resident in the tropics,etc.,runs a more severe course than usual;but how much this is due to the debilitating influence of the climate is a mooted point.The primary and secondary stages are much more severe,the tertiary less so.The general course of syphilis may be affected by the habits of the patient. Thus,those who spend their time in dissipation,especially in the abuse of alcohol,or are already suffering from alcoholism,are very unfavourable subject s for syphilis; and they often,when attacked by it,are never entirely free from some of its manifestations,their chance of living to an advanced age being of the remotest possible kind.He who leads a simle and regular life usually does well under treatment,other things,of course,being favourable.Tobacco and alcohol are the born enemies of syphilitics - particularly the latter when it assumes the form of chronic tippling,but not necessarily drunkenness.Alcoholics,and those who live under unhealthy conditions,are liable to have severe syphilis.The effect of tobacco is immediate,localand obvious as seen in the lesions of the oral cavity.Tobacco is most active in the secondary stage:alcohol in the tertiary.Insanity is a by no meansinfrequent outcome of syphilis;and alienists tell us that a man who had had syphilis often affects his wife so much that she ultimately ends her days in an asylum.Age has an important bearing upon the prognosis. The danger to life from congenital syphilis is great.In children the danger is due to the intensity with which the affection develops andruns its course:in old age to the slowness with which waste is repaired in the decaying organism,the disease in old people running a more chronic course,even if the symptoms have not been very severe.The younger and more robust the patient,other things being equal,the better the outlook;in old and debilitated individuals whose recuperative powers are gone,the chance of recovery is small indeed.Sex influences the

type of the disease more than its severity.Among women it is more apt to lead to anaemia of severe grade,and to functional diseases of the nervous system,than among men; and for this reason the symptoms of the early part of the second stage,in the former sex,often give rise to the idea that the patient is suffering from chlorosis,phthisis,or some affection of the spinal cord.Menstruation, pregnancy,and the menopause also have a bearingupon the disease.Furthermore,men are more easily dealt with than women.The liability of the patient to injury must also be considered.Injury induces relapses of tertiary symptoms and may accelerate the appearance of tertiary troubles.The course os syphilis is undoubtedly affected by the presence of intercurrent diseases.Bright's disease is one of the worst affections that can overtake the patient;for he is then unable to take mercury or the iodides with the usual indifference to their constitutional effects.The outlook is also rendered much worse by the occurrence of phthisis pulmonalis.The number of phthisical patients who have had syphilis is very great, and,in the opinion of some,indicates that the two affections are symbiotic.It has been suggested that phthisis, occurring in an individual who has had syphilis years before,runs a benign course,as the arterial lesions produce a pulmonary passive congestion which is inimical to the casual agent of tuberculosis.Syphilitics also often become scorbutic.The connection between the two is not altogether understood,but it suggests that syphilis renders the organism liable to extensive changes under slight privation.Acute infectious fevers are also unfavourable,both in themselves and from the fact that they call for a suspension of the specific medication during the period of their operations.Well-marked marasmus in syphilitics,particularly in the aged,is of serious import,even if the exhibition of the antisyphilitic drugs suffices to remove some of the local conditions.Pneumonia and other intercurrent diseases frequently carry off such patients.Hard work,mental and bodily fatigue predispose to arterial lesions and changes in the central nervous system.The patient's employment must therefore be taken into consideration.The effect of treatment is of prime importance in the prognosis of syphilis.No kind of treatment gives an absolute guarantee against relapse;but if a patient comes under the influence of treatment early and perseveres with it for two or three years,he may be informed that,unless he does something to aggravate his condition,no tertiary symptoms will appear,it being understood,of course,that no idiosyncrasy exists likely to interfere with the administration of antisyphilitic drugs.Under proper treatment all signs of syphilis,in a subject otherwise healthy,disappear as soon as the system is brought under the influence of mercury;in less robust individuals one may see relapses and successive manifestations of the malady.Tertiary and parasyphilitic manifestations are very apt to occur in untreated cases.The patient seldom dies in the first stage of syphilis,and only from the occurrence of some serious complication.Extragenital chancres usually result in a severe attack of syphilis,because their true nature is often unsuspected,and treatment is not commenced until secondary symptoms of an unmistakable kind occur.Simple chancres are in themselves benign, but patients often die when gangrene or phagedena occur.

Sometimes death occurs in the secondary stage of syphilis from the presence of some complication.Otherwise the secondary period is not dangerous to life.Great adenopathy points to a severe attack,and is due to the associated anaemia and debility,which tend to delay markedly the patient's recovery. The character of the eruptions which appear during this stage give some clue to the prognosis.Not only is a roseola in itself a lighter affection than a papular,or especially than a pustular,eruption,but it has less influence on the course of the disease than the more abiding rash:since the latter during its existence is constantly infecting the blood by a fresh proliferation of the syphilitic virus in the various local deposits.If this be true,it does not accord with the opinion of certain writers that there is a greater tendency to tertiary lesions,especially in the bones and internal organs,in those who exhibit slight syphilodermata.The mildest form of the eruption is the roseola;papular forms are more or less grave in character,and still more unfavourable is a pustular efflorescence,especially when tubercular in character.Late secondary rashes indicate a severity of infection,and are most common in alcoholics and those who have lived in the tropics.The abundance or scantiness of the eruptions doe not indicate the future course of the affection.Syphilis is the more unfavourable the more deep-seated and extensive and ancient its visceral lesions - the more so should the organ involved be a vital one;in other words,the syphilitic affections of the heart and brain and respiratory organs are those which compromise life,being capable in certain cases of causing death. The ascites,cachexia,etc.,of hepatic syphilitic lesions not infrequently kill the patient.The more nearly the results of the syphilitic processes approach the character of gummata,the graver usually is the prognosis.This distinction in the danger attending deposits of these respective characters is due to the fact that those of the secondary period consist of simple cell infiltration, which is persistent,but still capable of removal by absorption;while those deposits which are tertiary in character undergo rapid changes which lead to tissue-destruction.Moreover,this destruction is dependent on the importance of the organ affected.A simple proliferation of cells,which in course of time is converted into connective tissue or absorbed,has a very different significance according as it affects the skin or a bone, or the cerebral vessels,etc.Despite the fact that the prognosis of cases of this sort must always be unfavourable,it must still be borne in mind that many serious affections,more especially some of those of the nervous system,even such as epilepsy,various paralyses,aphasia, etc.,when not of too long duration,are more favourable in their course when due to syphilis,since the specific remedies sometimes remove the morbid conditions which would otherwise have been impossible.Especially in cases of syphilitic affections of the nervous system, considering that anatomical changes which cannot be removed are not infrequently etiologic,or that a temporary cure is sometimes followed by a recurrence,the prognosis must be guarded indeed.It is very difficult to formulate rules for the prognosis of cerebral meningeal syphilis,as it varies so greatly and so unexpectedly in its course.The general laws for prognosis in

brain disease hold to some extent,but may always be favourably modified,and patients apparently at the point of death will frequently recover under treatment.The prognosis is not,however,as absolutely favourable as is sometimes believed,and especially should patients be warned,of the probable recurrence of the affection even when the symptoms have entirely disappeared.The only safety after the restoration of health consists in an immediate re-treatment upon the recurrence of the slightest symptom.The occurrence of a complete,sudden hemiplegia or monoplegia is sufficient to render probable the existence of a clot,which must be subject to the same laws as though not secondary to a specific lesion.If a rapid decided rise of temperature occur in an apoplectic or epileptic attack,the prognosis becomes very grave. An epileptic paroxysm very rarely ends in death,although now and then it may.The prognosis in gummatous cerebral syphilis should always be guardedly favourable.In the great majority of cases a more or less incomplete recovery occurs under appropriate treatment,and one repeatedly sees patients who were unconscious,with urinary and faecal incontinence and apparently dying,recover.Nevertheless,so long as there is any particle of gummatous inflammation in the membrane the patient is liable to a sudden congestion of the brain,which may prove rapidly fatal,or he may dee in a brief epileptic fit.On the one hand there is an element of uncertainty in the most favourable case,and on the other it is not justifiable to give a hopeless prognosis so long as life exists.It may finally be noted that the question of syphilis and marriage is of great every-day importance,it being common to be asked how long a time must elapse before wedlock may be entered upon.The best thing to do is to inform the patient that he must carry out the treatment for three years,and then add another year if there is any doubt at the end of that time;in no case must a man be allowed to marry before the lapse of three years from the first appearance of the chancre;and a lomger period is advisable in the case of women.Hutchinson(Syphilis) holds that treatment for two years from the date of development of the chancre is sufficient.Most authorities,however,take a much more serious view of the indications,especially as regards women.Fournier(Sem.Méd., Nov.30,1898)says that in the event of pregnancy,when the father is syphilitic at the stage when the disease may be transmitted and when the mother is healthy,two classes of cases are considered:First,when the pregnancy is the first one,supervening shortly after marriage;and, second,when several previous pregnancies have resulted disastrously in abortion or in early death of the child. In addition to the above-mentioned period,there should be a quiescent one of six months at least.It is a safe plan to demand a period of five years,and a prolonged and efficient course of treatment.It must be remembered, however,that marriage is not synonymous with the procreation of children,and that the danger is much lessened if the woman is barren.In certain rare cases of great severity marriage is entirely out of the question, and must on no account be considered.

HEREDITARY SYPHILIS.

In giving an opinion as to the future of the

child the condition of the parents must be taken into due consideration.As a rule,the earlier in the disease of the parents the child is born,the more likely is that child to die.The liability to a fatal termination therefore decreases with each subsequent pregnancy.Exceptions to this rule are,however,observed.When both the father and the mother are syphilitic,the affection is more likely to be severe than when only one parent is diseased. The outlook for the child is much better when the parents have been properly treated.Bottle-fed infants seldom survive in public institutions,though they not infrequently do outside them.If the nasal lesions are of such a severity as to interfere seriously with nutrition,the outlook is less favourable than when the child is able to take its food in comfort.The degree of splenic enlargement may be taken as an index of the severity of the infection.Most cases die who show great enlargement of this organ.The outlook is always a grave one,but the later the appearance of active symptoms the less so.In cases of congenital syphilis it not infrequently cure is effected,and the child grows up into an apparently healthy adult;but severe syphilis in early life usually leaves indelible marks upon the system of the patient.

TREATMENT.

GENERAL CONSIDERATIONS.

The treatment of syphilis resolves itself into the preventive and curative; the former comprises the actual prophylaxis of the disease and the prevention of symptomatic expressions,- while the latter includes merely the therapy of the affection and symptomatic medication. The prophylaxis of the malady is a public question,and must take into consideration the protection of the future as well as the present generation.The prevention of the symptoms,and their cure when present,are parts of the general therapeutic plan and differ in no essential detail.Curative treatment is subdivided into the cure of hereditary and of acquired syphilis,and includes the so-called abortive treatment.The cure of the affection is the great means of limiting and suppressing it,as it prevents the person suffering from it frombecoming a source of fresh infection.On this account all classes of society should be considered alike,and the provision of therapuetic measures should be of the most liberal kind.At the present time the poorer classes of the community are not infrequently treated in an offhand and careless manner;until they are regarded as prolific sources of the greatest pesbific pest of the age syphilis will continue as generally destructive as ever. The disease is,of all affections,the one that can be most easily and most certainly cured,as we have a certain specific in mercury.In no class of malady is the good result of early and proper treatment so marked.Mercury is the specific of specifics,and it is to syphilis what water is to fire.Used intelligently,it seldom or never fails.Each case must be considered on its own merits;and never should the patient forget the risk of infecting others,the precautions to be taken,the danger of insufficient treatment,and the seriousness of the disease.

ACQUIRED SYPHILIS.

This may be considered first and the management of the hereditary affection subsequently.

PROPHYLAXIS.

GENERAL CONSIDERATIONS.

The question of the prevention of syphilis is one that has long vexed medical men,who even centuries ago gave the question the most careful consideration.From time to time various laws have been passed for the restriction and regulation of prostitution and the like. They represent the attempts of the governing authority to protect the community at large from disease and infection by regulating the hygiene of and placing restrictions on the class most liable to spread the disease. There can be no doubt that these measures are of great benefit;and it has been proved that clandestine prostitution,out of reach and control of these acts,is the great source of contagion in countries in which they

have been operative. There is no gainsaying the fact, however, that no method of prevention has yet been devised which is free from objection and capable of general application. It may also be admitted that, even while advocating the general principle of supervisory legislation as applied to prostitution, in the details of every plan yet proposed there has been much that was defective or positively harmful, and that the subject is still one of the unsolved sanitary problems of the age. But steps in the right direction have, nevertheless, been taken; and in the future it behoves us to point out to all concerned the necessity of a more general and more accurate public knowledge concerning the gravity and the prevalence of the disease. The innocent, who are also in this respect the ignorant, members of the community have claims which cannot be conscientiously disregarded. All persons capable of understanding should be made aware of the possibilities of contamination which surround him; every parent should be competent to protect his wife or children from all indirect infection through a servant or playmate, a household utensil or a toy; every wife should know that by permitting the approaches of a syphilitic husband she herself becomes liable to the disease, and to the conception of a child which has few chances of living and still fewer of being healthy and happy; and every syphilitic should realise that, except after certain intervals and under proper restrictions, his marriage is an outrage to the woman and an offence against the community at large. When such facts as these come to be widely and properly understood, an important step will have been taken not only by way of preventing accidental and guiltless contagion, but also in preparing public opinion for the legislative measures which are undoubtedly desirable. Another good result would be in all probability a diminution in the number of cases of this class of disease, who, in ignorance of the gravity of their ailment, consult the quacks and irregular practitioners who find here their favourite and lucrative field. Consequently, all possible should be done to encourage the education in this respect of the community at large, by means, for example, of discussions at society meetings, by proper representations to the newspapers, and by careful but truthful and forcible statements to one's freinds and patients, who usually find a willing ear to instructions of this kind. One of the most remarkable things about syphilis is its persistence in the face of methods sufficient to stamp it out; it is preventable, and for all intents and purposes curable, and yet it one of the most destructive and dreaded of all diseases. For all this the social evil is undoubtedly responsible, particularly in the case of the British Army, in which the number of days the soldiers were incapacitated from duty has increased threefold within recent years, though the strength has only been doubled during the period in question. In other words, the prevention of syphilis is the prevention of prostitution - the source of all sources of the disease.

CONTROL OF PROSTITUTION.

The problem of the Social Evil has received the attention of physicians and others from the very earliest times, and may attempts have been made to strengthen the hands of those who would radically deal with it. In early times the only efforts made were to superintend the cleanliness and dress of prostitutes, and to provide splendidly-appointed and attractive brothels. In the

midst of the free-love propensities of ancient Rome the people did little else to mitigate the prevalence of the disease and its congeners.But in the reigns of Constantine,the two Theodosius,and Justinian,severe laws were established for the restriction of prostitution.These enactments were prohibitory and ordered confiscation of furniture,clothes,and houses;they decreed that prostitutes should be whipped in public and banished thereafter. Everything in this ruling displayed good intentions,but a complete ignorance of the manners,habits,and management of the unfortunates concerned.The capitularies of Charlemagne in France presented the first instance of this excessive severity;but,during the four following centuries,all measures were abandoned despite the greatest immorality.On his return from the Holy Land,St.Louis endeavoured to apply a remedy to such a state of things by means of a prohibitory law;but seeing afterwards that he had only aggravated the evil,he ended by tolerating prostitution,which experience had taught him could not be abolished,and sought to regulate it for the purpose of diminishing the scandal and attenuating the evils of which it is the cause.Since that time special districts in France have been allotted to prostitutes,with special regulations controlling their trade.When the great epidemic of the fifteenth century broke out,it was sought to separate from all communication with others,even lepers, the persons convicted of being the subjects of syphilis. The sequestration of syphilitics was the law of that period.The rich were compelled to remain in their houses, the poor were driven away and threatened with death,and abandoned even by the the physicians,who felt themselves unable to combat the disease.On September 22nd,1497,James IV.of Scotland passed a law which stipulated that all persons affected with syphilis must leave the capital, failing which they would be branded on the cheek with a red-hot iron.The sanitary inspection of prostitutes was first initiated in Paris,by d'Argenson in 1814 and Berrier in 1747,and carried out by the police under their control.Fifteen years later,Aulas ordered that the persons who kept tolerated houses should be made responsible for the sanitary condition of their women,and that all,without exception,should be subjected to constant visits made by surgeons attached to the police and under the supervision of a senior medical officer.Eight and nine years later,respectively,Cardane and Borru pleaded for the establishment of public lock hospitals.Seven years passed,and then the chief of the Parisian police, Lenoir,ordered that prostitution should be efficiently supervised.But,in spite of its severity,this order,which was badly carried out moreover,did little good.Under the republican form of government the want of a distinct organisation made itself more and more evident,and enxiety was felt especially about the means of prevent contagion;it was then that a surgeon in the capital of France,in the first year of the eighteenth century,urged that there should be established in each arrondissement a place to which all prostitutes should be bound to come for bi-weekly examination,and where those should be retained who,having been ascertained to be diseased,could be isolated and afterwards taken to hospital.Next year a health dispensary was established.In 1811 it was organised with more care,and the benefits of this measure were soon recognised.Before long similar institutions

were established in the great centres of population,and thus there became organised a system of public prophylaxis which every day became more complete.These measures did not,however,appear complete and sufficient to all medical men;some demanded the application of sanitary visits to men also.Ratier urged that these visits should be made in the barracks of large towns,that the inspection of women should be more often and more regularly performed.Belgium took the initiative in this respect. The inspection of prostitutes,of sevent women,and of matrons was made there twice a week and entrusted to a controlling inspector for the purpose of preventing the propagation of syphilis in the army.Moreover,Vleminckx advised that no soldier should be treated in the barracks,and demanded that each one should be required to point out the woman who had infected him.The measures which he caused to be adopted has such results that,in 1846,only one soldier in one hundred and ninety was syphilitic, while at Strasburg the proportion was one in thirty-three,and at Lyons one in forty;since a large number of the troops underwent private medication,this number is probably greatly underestimated.Prostitution being the great source of syphilis,inorder to mitigate the destructive influence of the disease,and probably in the end to stamp the affection out altogether,the first and most important thing is to watch over the health of the individuals placed under the circumstances most favourable to its propagation,namelt,prostitutes.According to Fournier(On Syphilitic Contagion. Thèse de Paris,1860),out of eight hundred and seventy-three cases of transmission of syphilis there were six hundred and twenty-five public prostitutes, forty-six clandestine prostitutes, fifty-two actresses,kept women,etc.,one hundred workwomen,twenty-six female domestic servants,and twenty-four married women,wives of syphilitics.Despite the fact that these figures are most likely somewhat high on account of particular conditions,since it is a question of observations made in special hospitals in which public women abound,prostitution is nevertheless one of the most prolific sources of syphilis,though one capable of being remedied.It would appear that in France the manner in which the examinations are made is not the same in all the towns.In the capital of that country the women in licensed houses are seen every week,those living in their own rooms twice a month,the speculum being used every other time.In Bordeaux the examinations take place once a fortnight,and the use of the speculum is exceptional;at Marseilles and at Rheims the examinations are weekly.Daily observation shows that want of strict legislation and insufficient visits are the weak points of this organisation.In fact,we are forced to admit that in this respect Brussels and Hamburg are in advance of Paris.In both these cities the prostitutes are examined twice a week,and in every case the law insists that the speculum should be used.In addition to this,such sanitary measures are rendered largely ineffective by the great number of women to be examined,and the very short time devoted to each examination.Further,as the examination of the women takes place shortly after their arrival at the dispensaries,they do not failt to remove by washing and astringent injections the discharge and other signs of infection.They therefore defeat in many instances the object of the enactment in question.

Numerous physicians have pleaded for increased frequency of inspection visits;many hold that these visits should take place every three or four days,- but this interval of time is doubtless still too long,if we would combat the disease vigorously and endeavour to make it disappear entirely.Multiplying the visits is not enough;it is important to prevent decpption,and to avoid everything which may render difficult the diagnosis,which purpose can only be effected by keeping the women for some hours in a place specially provided for that purpose. An essential point is,and one upon which numerous writers have insisted,is to examine not only the genitalia,but also the skin,the mouth,the throat,the anus,etc.Since secondary lesions are contagious and produce infection more frequently perhaps than the chancre,this examination has become indispensable.Similarly,in hospitals an important point is not to leave prostitutes free immediately after the disappearance of the chancre,since these women become a fresh source of contagion when the period of secondary affections supervenes.The thing to be done is either to keep in hospital and treat every syphilitic prostitute during a time sufficiently long to insure a cure within the limits of possibility,or,after a longer or shorter time,to place her at liberty,but to keep her under special observation.This second means, which is the easiest to effect,would necessitate the attendance of the woman every second or third day at the dispensary,after which,if she were found to be again affected,she would be sent again into hospital.Prostitutes living in their own homes should be similarly dealt with.Women of the working class and married women would be difficult to deal with.Punishment of the man who knowingly gives syphilis to a woman would be strongly operative in a prophylactic sense.Measures indispensable for diminishing the prevalence of syphilis, if not of preventing it entirely,are such as include closely watching prostitutes at home and elsewhere, obliging them to undergo,every two days at least,a strict examination,and detaining all such as are suspect-ed and not to set them at liberty in cases of undoubted syphilis.Until prostitution shall everywhere be subjected to very stringent regulations syphilis will not cease to exist.On the other hand,there have been not a few who have pleaded for the total abolition of State regulation of prostitution;chief amongst these perhaps is Von Düring,who offers the following amongst numerous objections thereto:First,a false sense of security is afforded by medical supervision,which is obviously incomplete in character.Second,it is a hardship and productive of great misery;and in this the State should have no share. Third,It is impossible in large large centres of population to correctly determine the number of public women, most of the prostitution is secretly performed,and it is therefore ridiculous to dream of regulating the evil. Fourth,on ethical grounds State regulation of prostitution is objectionable.Fifth,licensed houses for prostitutes are uncalled for by the exigencies of the times,as shown by the fact that in foreign countries they are less numerous than heretofore and that only a very small proportion of public women have anything to do with them.Sixth,Brothels are a source of public menace,being essentially immoral,deductive to the youth of the community and giving them the impression

that illicit intercourse is safe and preferable to the legitimate act;brothels convert their inmates into slaves under terribly degrading conditions,and and prolific sources of sexual perversions;they do not do away with the street traffic,as shown by the few prostitutes who resort to them.Seventh,police supervision is uncalled for and supererogatory,and is defective in that it provides for the inspection of women only,the equally infected men escaping.Eighth,public opinion everywhere is against the idea.Ninth,the method had been given a long trial and has proved a signal failure.The question of the regulation of prostitution by the State is therefore a mooted one,some urging it,others strongly deprecating it.The subject,however,is still receiving the earnest attention of those who have the welfare of the community at heart.Physicians,clerics,social reformers, andothes are united in a strong and persevering endeavour to stem the tide of the Social Evil.The uphill fight against this great source of veneral affections is a matter of public health and social hygiene,and must claim the consideration of all those who have the welfare of the general community at heart.The dangers arising from syphilis,they say,should be understood by everyone,and public instruction should be given on the point. Theoretically the only legitimate means of preventing the disease would be continence and self-control;but we,as medical men,must look at human nature as it actually exists,and bear in mind the fact that some men find it impossible to control their passions,and also that others would not do so if they could.The result of this is that prostitution must continue to exist until the public is sufficiently enlightened to understand its dangers.If the individual infected were the only one to suffer,it would not matter so much;but wives,mothers,and even little children are involved in the machinations of the pest.At this juncture the question may well be asked:Why do women become prostitutes?The very idea is hideous.The causes of such social soul-destroying degradation are numerous.Some women are born to the trade - of that there is no doubt;but the vast majority are by a fortuity of insuperable circumstances forced into it.The born prostitute is morally insane and,let us gladly allow,very uncommon.Hopeless poverty,the lack of the bare necessaries of life,the existing laws of society,low wages,and one-roomed houses are responsible for the creation of innumerable prostitutes.Those who earn little and have to keep up a certain position thereon are forced to augment their incomes;and the easiest way to do this is by public or clandestine prostitution.The abolition of sweating and the the compulsory payment of a living wage would obviously tend to diminish the number of prostitutes.Those who knowingly underpay their workers are more to blame for prostitution than others;and they should be held up to public scorn on all occasions,if not actually punished.The one-roomed house is an abomination, for when males and females live in the same apartment nothing but the obvious evil can result.The women are trained as prostitutes and,when even children are present,the licentiousness is not diminished.The little ones see what takes place,look on it as right,and increase the great army of prostitutes when older.Bastardy is also a prolific source of the evil;the erring woman,when discovered,is despised and rejected,impoverished and the

obvious thing results.There is no doubt that the total abolition of prostitution would ultimately eradicate all venereal diseases;certainly it is the object of all campaigns against syphilis,but can only be accomplished by international measures.The combat against the malady is a matter of public concern,and not the province of medical men only.It is impossible to say anything in favour of prostitution;its evils are innumerable,and it abolition in some way or other is urgently required.We have seen that numerous attempts have been made to deal drastically with the question.Registration,medical inspection,and compulsory treatment,if necessary,have been advocated and on trial found wanting.Prostitution has never been suppressed by legal enactments,and it is my opinion that it never will.

PUBLIC MEASURES.

Various public measures have been proposed for the prophylaxis of syphilis.Not a few writers have pleaded for the imposition of an exemplary penalty for the knowing communication of the affection to others;and on the ground that the syphilisation of another is a bodily injury which should be punished in the same way as an assault or battery.There are,however,obvious difficulties in the way of carrying this idea into actual operation.At present it is urged that the transmission of syphilis from husband to wife and wice versa should constitute sufficient reason for divorce;and,despite the difficulties in the way,it would seem that at some future date it may,for the injustice done is beyond question,and legal satisfaction should be forthcoming in every instance.Another prophylactic measure urged by some is the provision of a certificate of health prior to the legalisation of any marriage.Objected to this have been the facts that the State has no right to inter-fere in what is essentially a private matter,that medical men have no right to reveal secrets of this kind, that we are physicians and not policemen,that the dignity of the medical professions forbids,and that all sorts of abuses would obtain.Nevertheless,we should do all in our power to prevent the marriage of syphilitics.In no case,no matter how trivial may have been the earlier symptoms,should consent be given to wedlock before the lapse of two or three or four years from the time of infection,and this only when vigorous antisyphilitic measures have been followed during the greater part of that time.The sanitary examination of men has also been proposed by those who claim that the no scheme of prophylaxis can be complete without it.It is now a great number of years since the desirability of the examination of soldiers and sailors was pointed out.Certain writers maintained that in times of peace only men previously ascertained to be healthy should be assigned to country barracks;no furlough should be granted without firstly taking the same precuation,and,in case of venereal disease,not until complete cure has been effected.Others contended that no national or foreign sailor should be allowed to disembark until after he had been examined by a medical man.The importance of examining sailors is not doubtful,and its execution perhaps not altogether impossible,since quarantine is enforced in the case of all suspected ships.We have seen that in the case of soldiers in Belgium their inspection led to a marked diminution in the prevalence of the disease;

and in this country doubtless great benefit would arise from the introduction of regulation on similar lines.It is true that in both the Army and Navy,as well as in the case of certain government employees,examination and compulsory treatment obtain;and there is every reason to favour the extension of the method to all government servants.Further,all tramps,beggars,workhouse inmates, and prison populations should be regularly inspected for syphilis,and suitably dealt with forthwith on its discovery.It would appear that in Germany the workmen in some of the large government factories are examined every month for the presence of contagious disease.Men employed in the glassworks in the neighbourhood of Lyons are periodically examined.It would be but a slight infringement of the liberty of the individual to subject to examination the numerous workmen employed in mines.In the fifteenth century regulation were in force that persons keeping licensed houses in London should cause to be examined not only the prostitutes therein but also the men who frequented them;and since then some writers have thought that the best means of reaching the sources of syphilis would be to examine the customers of prostitutes.Diday,an aloquent advocate of prophylactic measures,pleaded for a police regulation obliging the keepers of licensed houses to examine the men presenting themselves there,and not to admit them until they have been proved healthy.The idea was adopted in Germany,and seems to have been productive of benefit.More than a hundred years ago,Borru demanded that all persons who knowingly communicated syphilis and infected others should be severely punished,in accordance with an obvious common-sense requirement,in the way of a fine or indemnity.Provided false accusations do not arise,there is a great deal to commend the measure.The treatment ofthe disease by quacks and irregular practitioners should be abolished,and the provision of a sufficiency of special institutions or wards for the treatment of the disease should be seen to.Proper hygienic supervision should be exercised by the State over glass-blowing and other industries which are known to be prolific sources of syphilis.Vaccination should be performed under proper precautions,and no longer be accused of propagating the disease.The subject of syphilis should be made aware of the fact that he is a danger to the community,and he should be warned against having personal contact with others for at least two years,even though no obvious symptoms are present.All spoons,cups,pipes,and other things likely to come in contact with the mouth of the infected person should be disinfected before being used by others:better,he should have a supply of these articles for himself - he should have also his own towels, etc.,and neither kiss nor sleep with others.Great care must be taken in the disinfection of dental and other instruments,and no operation should be performed on a syphilitic individual unless indiarubber gloves are worn; none should examine a syphilitic woman per vaginam without taking the precaution of wearing a fingerstall.After each contact with such a person antiseptic lotions should be used,and during any examination antiseptic or mercurial ointment should be employed for personal protection. Medical students should have a thorough grounding in all the protean phases of syphilis;some hold that they are never properly instructed in the management of the

disease."This explains;says Fournier,"why medical men mistake chancres and mucous patches for something else; why they give syphilitic infants to the care of a healthy nurse,or inversely;why they regard syphilis as cured within a few months or even weeks of treatment,and why they permit marriage to uncured syphilitics." A professor of syphilography should be appointed in every university;this has not been done yet in any country, though the desirability must be obvious.Proper venereological dispensaries should be established where proper instruction can be given,and be made part of every qualifying course;for education offers the greatest hope in the prevention of this,as in the case of other diseases. The education of the laity is equally important,particularly as regards the dangers of prostitution.The youth of the nation demand special consideration in this respect,for it is during the years of inexperience and ignorance that the disease is most often contracted. Thus Fournier found that amongst eleven thousand cases the maximum incidence of syphilis was attained at the twenty-third year in men and the twentieth year in women.The risk of contracting syphilis innocently should be impressed upon the community,particularly as regards wet-nurses,by kissing,and so forth.The close association between alcohol and venery should be pointed out; the question is temperance is of great importance to the syphilologist.

PRIVATE HYGIENE.

Patients should be instructed in certain elementary rules of hygiene.The importance of the point,indeed, was pointed out long ago by such writers as Celsus,who fully entered into the question.Lanfranc,in the thirteenth century advised washing the penis with vinegar and water as a prophylactic measure against the diseases caused by intercourse with tainted women.The poet-philosopher,Frascator,advocated lemon-juice.Fallopius considered lotions of mercury and guaiacum highly effective.Aromatic and alcoholic washes were used by some physicians.In the seventeenth century Ettmuller advised washing the part with a mixture of turpentine and wine. Later on,Mahon recommended for the same purpose a solution of alum.Waren suggested,after coitus,the application of an astringent ointment,followed by washing and injection with an alkaline solution.In the eighteenth century Gardanne proposed a preservative consisting of lime-water,alcohol,and corrosive sublimate;and Hunter and contemporaries,like him,recommended alkaline solutions. Coster,at the beginning of last century advised the use of chlorine and its preparations.Ricord recommends most of the substances mentioned above,and even chlorinated lotions;acids,alkalies,water,alcohol,wine,and solutions of sulphate of zinc and lead have all appeared to him to be of some use,but on condition that the virus of the disease has not yet entered the system. Langlebert recommends a fluid which is a kind of compound of the preceding;it is a mixture of soft soap, potash,and rectified spirits of wine,with the addition of essence of lemons.A fluid very similar,but more caustic,has been proposed by Rodet;it contains perchloride of iron,hydrochloric acid,and citric acid.Other substances were recommended by the earlier writers, especially oils and fats.These substances,in respect to their physiological action,may be arranged in three

classes.One class modifies the circulation of the part to which it is applied and tends to prevent absorption; these are the alcoholic and astringent lotions,such as vinegar and water,solutions of tannin,alum,etc.Another, like fats,protects the organs,in the shape of a coating, and thus prevents absorption.The third class,more energetic,consists of substances intended to destroy the poison,some of which are strong enough to act as caustics.Not one of these substances is an absolute protective.Each of them has,however,a relative utility,and special indications.Thus fatty substances,which keep up the suppleness of the parts and tend to prevent absorption, may be used with good effect by the male before the act, and by nurses before giving the breast.Alcoholic solutions,acids,or alkalies may be employed at any time,and if a solution of continuity be observed,some advise the use of caustics,nitrate of silver,for example.Avoidance of exposure to syphilis is the only certain method,however,of escaping the disease.Every physician should be emphatic on this point when asked his opinion;and he need not give any further information,though under proper circumstances he should not withhold knowledge as to the means by which the danger of contagion can be lessened,if not entirely avoided.This danger can be diminished by such measures as the following:Cleanliness is the great thing to be practised;a clean body and clean clothing can to a certain extent prevent the spread of the disease.Circumcision is undoubtedly operative;for it is a well-known fact that the Jews are less often syphilitic than the Gentiles,other things being equal.Hutchinson and other authorities recommend it;it is particularly useful in the case of individuals with redundant or phimotic foreskins.After every suspicious intercourse there should be the immediate application of antiseptic lotions to and superficial cauterisation of abrasion acquired during the act;lotions act mechanically in removing the virus of the disease from the part.Micturition would seem to have the same effect.Astringents should be used by those whose mucous membrane is particularly vulnerable,and the genitalia should be thoroughly washed with antiseptics immediately before and after connection. The professed libertine should take the precaution to carefully examine the woman for any discharge,suspicious spots or scars;and never must he omit this precaution. The use of a cover or condom on the penis is perhaps the oldest and most trustworthy preventive of syphilis;such applicances are made of indiarubber or other flexible and thin material,and cover up the exposed part during the act.When of good quality,when properly fitting,and when carefully removed afterwards they are most efficient; both parties receive a full measure of protection thereby.The employment of various protective and antiseptic ointments has been long in vogue.Most writers prefer unguents.The penis may be anointed before and after coitus with an antiseptic ointment,but the protection therefrom is only relative;better this,however,than nothing. According to Metchnikoff and Roux,who specially experimented on apes,it is possible to destroy the syphilitic germ by applying a strong antiseptic ointment to the point of inoculation within an hour and a half from the time of inoculation.They used a thirty per cent.calomel ointment,and also one composed of salicyl-arseniate of mercury.When the same experiments were conducted on

these animals with the same virus,a chancre developed when the ointment was not used.Furthermore,a medical student subjected himself to inoculation,and the ointment prevented him from contracting the disease.On the other hand,Neisser failed to secure the same results when he repeated the experiments.Metchnikoff claims a specificity for the application,five minutes after the suspicious intercourse,of a thirty per cent.calomel ointment,which is vastly superior to lotions and antiseptic washes.It may also here be specially noted that the danger of extragenital infection may be mitigated by the avoidance of prolonged contact of any portions of the body,especially of the lips and tongue;care as to the cleanliness of eating and drinking utensils,pipes,or any article which is liable to be contaminated by the discharge from the lesions of syphilitics;and the immediate cauterisation of any abrasions of wounds which could possibly have been infected by the discharges from syphilitic ulcers, mucous patches,and so forth.One of the best ways of preventing the spread of syphilis is to strongly impress upon those suffering from active syphilis the fact that all their bodily secretions are liable to be contagious. They must be instructed as to the possibility of infecting others from cigars,spoons,forks,or other articles moistened with their saliva,or from razors,manicure instruments,scissors,or knives which may be stained by their blood,and from handkerchiefs,sheets,pillowcases, garments,sponges,or baths which may contain the virulent discharge from cutaneous,mucous-membrane,or other lesions.The unwholesome act of kissing must be forbidden all syphilitics;and they must be warned not to have intercourse or bodily contact of any kind with others.In the case of the surgeon,the accoucheur,and the dentist,the possibility of infecting patients by means of the blood incident to accidental wounds of the hands must be duly considered;indeed,this danger is sufficiently pronounced to prohibit the performance of difficult or extensive operations during the active stage of syphilis.In addition to this,barbers,masseurs,chiropodists,and all whose occupation requires them to treat the skin and its appendages by instruments or by the hands,should be made well aware of the possibility of conveying the disease. They should be obliged to sterilise their instruments by heat or antiseptics before using them on others;and when they neglect these precautions and syphilisation results,they should be held answerable at law.

WET-NURSING.

From the prophylactic standpoint it is very important to bear in mind that a syphilitic child or a syphilitic may become a prolific source of infection;the mouth of such a child may infect the breast of the nurse,and the child may become infected by the mouth of the child.The candidate for wet-nursing should be very carefully examined;and this should apply not only to the breasts,the mouth,the pharynx,and the cervical glands, but to the genitals also.Any child previously suckled should also be examined for signs of the disease;for syphilis transmitted by the nurse is most often due to a former nursling affected with hereditary syphilis. It is as well to bear in mind that these persons are not above practising deception,and that a woman whose interest it may be to deceive may very well palm off for inspection some other woman's nursling as her own. It has been suggested by some that every wet-nurse

seeking employment should be able to bring with her a certificate of good healthy signed by a qualified practitioner,and,failing this,should be debarred from nursing as long as ever it is possible for her to communicate the disease.It must not be forgotten that the woman may be incubating the affection received from some other child,and so pass it on to another.Two months should therefore elapse between each nursing engagement.Every syphilitic child should be suckled by its own mother when possible,failing which a syphilitic wet-nurse should be employed or the infant be brought up by hand.

SERUMTHERAPY.

Very uncertain and unsatisfactory have been the results obtained from antisyphilitic vaccination,and great developments must occur before the State can interfere and make it compulsory as in the case of vaccination against smallpox.Blood serum from secondary and tertiary syphilitics,serum from congenital cases,serum from the secretions or syphilitics,and the serum of syphilised animals have all been employed to this end. Now that the specific parasite has been discovered something may come of the method,though the great obstacle in the way is the fact that the spironema cannot be cultivated and certainly not on a scale large enough to effect the present purpose.Doubtless in future this difficulty will be satisfactorily overcome,the more so as Levaditi has managed to cultivate two analogous spirilla,those of fowl septicaemia and of relapsing fever.The question of the serumtherapy of syphilis is still in its infancy.Richet and Hèricourt failed with defibrinated blood,and Roux and Metchnikoff were similarly unsuccessful with hypodermic and intravenous injections of syphilitic serum.Their experiments on monkeys were held to show that the poison of the disease,if passed through macaci,becomes attenuated both for these animals and mankind;and it may be that inoculation with an attenuated virus will in future give the desired immunising results,though to a limited extent.Thus the free use of an antisyphilitic vaccine might increase the prevalence of tabes and general paralysis or other parasyphilitic affections,which have been known to occur in the case of even mild infections.Krauss and Spitzer have vaccinated subjects of hard chancre against the development of secondary lesions,and,they say,with satisfactory results; their experiments were repeated by Brandwenier and others, who tell is that syphilides will ultimately appear despite these means.

ABORTIVE TREATMENT.

It must be admitted at the very outset that it is absolutely impossible to abort syphilis once the chancre has appeared;syphilis may abort itself,but such cases must be regarded with suspicion and be properly treated nonetheless.The chancre is merely the local manifestation of a general infection,so that attacking the primary lesion is like locking the cage after the bird has flown. Numerous indeed have been the attempts to cut syphilis short by excision,cauterisation,or injection of the chancre;but efforts in this direction have almost without exception proved signal failures.In a very few of the many reported cases excision seemed to be successful in preventing the development of the constitutional disease; but it is my opinion,nevertheless,that constitutional

syphilis would not have developed even if the operation had not been undertaken,since the course of untreated cases shows that a certain small percentage of undoubted chancres undergo abortion spontaneously.The disease cannot therefore be locally aborted;and bearing this in mind the method of cutting out the chancre is admissible in order to rid the system of a focus of infection,or for cosmetic or other reasons,and if total excision does not leave a deforming or crippling scar there can be no objection to it.It must be remembered,in considering the results of this operation,that the ulceration of chancre, even though it appear extensive and deep,usually disappears under constitutional treatment,leaving an extremely insignificant cicatrix.Ehler holds that excision of the chancre lessens the severity of subsequent phenomena, since thus there is cut off from the system a large amount of infection;he also thinks that in a certain proportion of instances the constitutional disease is completely aborted.Fournier says that excision of the primary lesion is successful in twenty per cent.of the cases.The subject is,on the whole,a mooted one;and there are writers who affirm that when the chancre is seen within a few days of its appearance and before the lymphatic vessels and glands in anatomical relation are enlarged,the disease may still be purely local,and constitutional poisoning may be prevented by complete excision of the infected focus;they,arguing this,hold that such a sore should be removed by excision when it is favourably located for this operation,or should be destroyed by cauterisation under other circumstances. Undoubtedly the operation,properly conducted,can do no harm,and,if one believes in its efficacy,when the sore is located upon the prepuce or upon the skin of the genitalia,it,together with the apparently healthy surrounding tissue,may be picked up with a pair of forceps and removed with a pair of curved scissors.This wound may be sutured,or,to give greater assurance of the purpose of the operation being fulfilled,the raw surface may be cauterised with nitric acid and dressed with the usual antiseptics.Nitric acid or the actual cautery may be employed to destroy the sore when it is so located that its removal by the knife would give rise to troublesome bleeding,deformity,or interference with the function of the part.When seven or more days have elapsed since the development of the sore,and in which dorsal penile or inguinal adenopathy has been observed,cauterisation is not to be thought of in any case,on account of its undoubted uselessness at that stage in preventing constitutional disease;the pain which it causes;the inflammatory action which ensues,and which not infrequently produces enough oedema and swelling to cause phimosis, and thus convert an open sore into a hidden one;the subsequent effusion of lymph,which simulates true induration and confuses the diagnosis;and,finally,the greater liability to the causation of suppurative inflammation in the ordinarily indolent bubo of the disease. Bronson has advicated the subcutaenous injection of mercurial preparations beneath and around the induration of the chancre and into the indurated lymphatic glands; he bases his method upon the idea of the antidotal action of mercury when brought into immediate contact with the casual agent of the disease.The plan has not been successful in other hands than his.The only local abortive treatment,we have seen,worthy of the name is

the application of a thirty per cent.calomel ointment within twelve hours of the infective intercourse - bearing in mind,however,that this is by no means invariably reliable:indeed,not infrequently useless.Another method prpposed for the abortion of syphilis is the destruction of the specific germ by active constitutional treatment.In view of the microbic nature of the affection and of the specific action of mercury in checking the machinations of this microbe,the value of early administration of the antidote is undoubted.Evidence as to the subsequent irregularity and virulence of cases thus treated is greatly overbalanced by the testimony of innumerable competent observers as to the lessened severity of such cases.The question which must be considered,and which should influence the time of administration,is that of diagnosis.Mercury should be given as soon as the diagnosis is made;as there is no absolutely pathognomonic characteristic of the chancre,this can,however,be established only by the development of the secondary expressions of the constitutional taint.Anyone called upon to advise in cases which involve the whole future of the individual,his relations to the other sex,his determination towards matrimony or celibacy,his matrimonial relations if he should be already married,the question of the influence of paternity,the institution of a course of treatment extending over years,the diagnosis of any obscure visceral troubles which he may develop later in life,the profoundly depressing mental effect which a knowledge of syphilitic infection usually has on persons of intellect and refinement, should, bearing in mind the possibility of error think twice before commencing a therapuetic course by means of which the diagnosis may be obscured or rendered altogether impossible.Though the subsequent course of a case of syphilis is not favourably influenced by delaying specific medication until the appearance of the secondary phenomena,the gain from the immediate treatment during the primary lesion is not sufficient to counterbalance the doubt and uncertainty which that medication not infrequently casts about the future of the individual.To the general rule that mercury should not be given until the diagnosis of syphilis is assured by the appearance of secondary symptoms of the disease there are some necessary exceptions.Thus,the drug may be administered immediately when the chancre is typical and confrontation confirms this;when the chancre is typical and its continued existence would destroy or imperil the conjugal relations of man and wife or possibly the happiness of all belonging to them;when the characteristically indurated chancre shows a marked tendency to spread and affect important structures in its vicinity;when the chancre is located in such prominent positions as the lips or the nose,and so inform the world of the loathsome disease present;when the chancre is placed in such positions,as on the finger of a physician or accoucheur, that others may become infected by it;and when typical chancres make their appearance in the case of women in pregnancy.Apart from these things,however,one ought to wait for the appearance of the secondary symptoms which point to the presence of the constitutional disease.It is not necessary to wait for the development of the characteristic syphilides.Treatment may safely be commenced when,after a suspicious sore upon the genitals,

consecutive enlargement of the epitrochlear or post-cervical lymphatics ensues,or there occurs an otherwise unaccountable decrease in haemoglobin or a leucocytosis. From all this we may conclude as to the abortive treatment of the disease that when the primary lesion is seen early before the occurrence of the characteristic adenopathy,and especially when the diagnosis is confirmed by the history of the case and the admissions of the patient, it may be excised or cauterised according to its position.The prospect of thus aborting the malady is slight. In the opinion of some,however,it is sufficient to justify the operation.Secondly,thorough antiseptic treatment of chancres can have no abortive effect,but is valuable as a means of preventing mixed infection.Thirdly,while it must be admitted that mercury should be administered as early as possible,the advantages incident to this early treatment do not warrant its inauguration before the diagnosis is absolutely sure.Finally,this diagnosis can be absolutely assured only by the appearance of some general symptoms(we are here disregarding the fact of the recognition of the spironema being absolutely diagnostic and considering other aids),such as changes in the blood,adenopathy,or roseola:so that the exhibition of mercury to abort the disease solely on the basis of a diagnosis founded on the presence of the chancre alone is not advisable in the absence of a certain diagnosis or some very urgent or special reason.

CONSTITUTIONAL TREATMENT.

GENERAL MANAGEMENT.

The general management of a case of syphilis must keep largely in view the urgent desirability of hygiene under all circumstances;attention to little details is of great importance.All possible should be done to bring his system up to a robust standard so that he may successfully resist the depressing and debilitating effects of the mercurial course which he must undergo.Careful inquiry must be into the existence of any idiosyncrasy to the form of treatment proposed.Both strong and weak patients will require careful attention to the hygiene of the mouth.The teeth should be put in perfect order by a reliable dentist,and should be kept scrupulously clean through the entire course of the treatment by cleansing washes,astringent mildly antiseptic powders,and careful removal of particles of food by means of toothpicks or a toothbrush after eating.Upon the health of the mucous membrane of the mouth depends to a great extent the ability of the patient to take an efficient quantity of mercury without causing salivation.The patient must be warned against the evil effects of smoking and chewing; otherwise mucous patches will form and be largely instrumental in transmitting the disease to others;the nicotine habit delays the cure in all cases and has a particularly unfavourable effect upon the secondary stage of syphilis.The use of alcohol must be avoided during the active stage of the disease,and it had better be entirely abandoned.It is the born enemy of syphilis, it lowers the resisting-powers of the patient,and weakens the curative influence of the iodides.It is to the tertiary stage what tobacco is to the secondary.In certain cases light wines may be taken with meals,but nothing stronger under any circumstances.The hygiene of the gastrointestinal tract should also receive

particular attention,and be kept free from irritation by well-regulated diet,by digestive and antiseptic powders,and by mild laxatives when indicated.The sour-milk treatment,at present so popular may be tried in suitable cases,the salutary influence of the lactic acid bacillus being well known.Only when the stomach and bowels are in good condition can the full dose of mercury be taken by the mouth and be absorbed without exciting symptoms of gastrointestinal catarrh.The bowels aid in the elimination of the drug.The skin also assists in this,and should be kept in perfect condition by daily bathing and friction,hot or cold water being employed in accordance with the feelings of the patient.In the absence of marked vascular degenerations,hot plunge baths,Turkish baths, and hot-air baths may be employed.The diet should be of a liberal sort,as a semistarvation,so much advocated by the earlier writers,tends to the occurrence of the toxic symptoms of mercury.Coffee,fruit,and other things producing diarrhoea must be avoided.The patient should,of course,have his own dishes and towels during the contagious period of the disease,and intercourse with others must be avoided.We may here again emphasise the heinousness of kissing,and the dentist must be told of the disease that the patient is suffering from.Excesses of all kinds must be avoided - venereal and general;the patient must as far as possible lead the simple,regular life.He must have plenty of fresh air without,of course,exposure to sudden changes of temperature or rain.Sometimes a change of air,such as is forthcoming from a sea voyage, is beneficial and may aid the beneficial effect of the drugs.Tonics are always of service,such as cod-liver oil,Fellows' or Easton's syrup,malt preparations,petroleum emulsion,sanatogen,and so forth.It is very necessary that the hereditary tendencies and diathesis of each individual should be studied,since every depressing influence by lessening tissue resistance may lead to increased virulence of the disease.Tuberculosis in the form clinically recognised as struma particularly favours virulent manifestations of syphilis,such as deep and obstinate ulceration,ostitis,caries,and various visceral changes.A tubercular family history should, therefore,be regarded as special indication for hygienic precautions.A patient with such a history should spend at least a part of every summer at the seashore or in the mountain air,should avoid all causes of local congestion,such a chilling of the surface,and particularly should guard against bruises,sprains,or other traumatisms,slight in themselves,but strongly predisposing to the local development of strumous and of syphilitic lesions.The diet should be rich,of digestible fats,and carbohydrates.Pulmonary gymnastics should be employed, and to the specifici treatment should be added emulsions of partly digested cod-liver oil in combination with hypophosphites or the iodide of iron.The course of the disease is,according to my experience,very unfavourably influenced by both the gouty and the rheumatic diathesis.They predispose to vascular degeneration,to cerebral disease secondary to endarteritis,to troublesome papulosquamous syphilodermata,to iritis,to periosteal nodes, and various other affections of the fibrous tissue.The diet of such patients should be most carefully regulated.They should be told to eat sparingly of red meats and of sugars,to drink freely of potash or lithia

waters,and to avoid sweet wines,malt liquors,etc.In combination with the above treatment,short courses of salicylates may be advantageously employed,and the iodides should be given much earlier than in the case of previously healthy individuals.I have also noticed that persons of a neurotic temperament seem specially predisposed to affections of the brain and spinal cord.They must avoid worry and mental strain of any kind.Every effort should be made to prevent that state of nervous depression which the knowledge of having contracted syphilis so often occasions.Rest to the mind,and diversions of various kinds,particularly those which require mild exercise,such as riding,cycling,golf,and long summer vacations spent in the open air,should be insisted upon.The treatment should be unobtrusive,the prognosis to the patient hopeful.Long hours of rest are particularly desirable.Tonics here come in very well;strychnine is perhaps the best one for exhibition.

HEALTH RESORTS.

The advantage of sending a syphilitic patient to a suitable health resort is that he secures there freedom from the ordinary commercial and social worries of everyday life;freedom from the special worry of remaining at home whilst suffering from a secondary eruption on the face and an infectious condition of the mouth and throat;he receives good air,suitable exercise,and proper diet,without the necessity of hurrying through meals;special facilities for inunctions,baths,douches, and the care of the skin;and in not a few instances supervision by medical men who have specialised in the management of the disease.One of the best known and most advertised health resorts is Aachen in Germany;but there are many others,such as Bagnères-de-Luchon and Ax-les-Bains in Savoy,Wiesbaden in Germany,Hot Springs,Arkansas,in the United States of America, as well as numerous places with thermal and sulphurous springs.The baths at these places maintain the skin in good condition during treatment,and probably favour the excretion by the kidneys of the specific toxins of the disease.Internal courses of waters likewise help to flush out the body, and probably minimise the deposition of mercury in the tissues.It is possible also that sulphurous waters,when taken internally,may help to ward off mercurial enteritis,and that a course of sodium chloride waters favours metabolic processes generally,and therefore those undergone by mercury as it acts upon the system.The eliminative effects of the waters of such places as we are considering is of great value,the toxins of the disease being forced out of the system.An equally important indication is to protect the patient from overwork and mental worry.In certain cases this can be best accomplished only by having them treated at some health resort during the active stage of the disease,and by advising them as to the danger of excessive bodily and mental strains and the value of regular holidays in suitable climates;they must understand that this advice applies not onby to the period when they show obvious signs of the disease,but that the same hygienic mode of life must be continued for many years after the disease has quite taken its departure - better still for a lifetime. The cachexia of syphilis is often attended by marked tertiary lesions in the internal organs,though it may occur without other coincident indications of the

disease.In some cases of syphilitic cachexia the anaemia may be excessive,and the appearances in the blood observed may be very like those of pernicious anaemia. The ordinary specific medicaments may entirely fail,and the case resist all forms of treatment.The haemopoietic functions seem to be affected either by the toxins of the disease or by a local syphilitic process affecting the marrow and cancellous tissues of the bones.Suitable climatic resorts may be of use in such cases.During summer,simple thermal or thermal sulphur spas amidst cool woods and in beautiful mountain valleys may be tried.The elevation must depend upon individual indications.Ordinary hydrotherapeutic treatment,when judiciously managed,often has a most beneficial influence.Occasionally also ferruginous and arsenical waters may be of use.The winters ought to be spent in warm,dry,sunny climates,such as the Riviera and Egypt,where the diminishing powers of resistance towards cold are not overtaxed.The question of the simultaneous use of specific remedies must be considered in each patient.Some of the worst cases are too bad for removal to a health resort until a certain degree of improvement has taken place under home treatment. In every case careful attention must be given to the hygienic treatment.Thus,at first more or less complete rest is required,and this indication can be fulfilled by arranging a kind of open-air treatment,like that employed for phthisis pulmonalis. The earlier writers claimed for mineral waters a specific influence upon syphilis,which later investigations disproved;nevertheless,they are not without a certain amount of benefit.They are capable of invigorating the patient's system,and of improving the impaired nutrition resulting from the constitutional disease or from injudicious courses of treatment.They have,however,a special purpose also,inasmuch as they hasten the appearance of the delayed local lesions of the skin,causing latent syphilis to become manifest,and in this way verifying the diagnosis in doubtful cases.The thermal sulphurous waters especially,employed for drinking and bathing,are the best adjuvants to the specific treatment of syphilis by means of mercurial inunctions.By the employment of these thermal baths not only is the power of the skin to absorb mercury increased,but also the action of this remedy is augmented by the elevation of the temperature of the body and heightening of proteid metabolism. These thermal sulphurous baths constitute moreover,an admirable remedy against the varieties of rheumatism, arthritis,and mercurialism associated with syphilis.A special reputation is enjoyed by the thermal sulphurous waters of Aachen(Aix-la-Chapelle),Baden in Austria, Baden in Switzerland,Bagnères-de-Luchon,Pistyan,and Mehadia.In cases of syphilis of an obstinate sort it is necessary sometimes to intermit the employment of specific measures;then in the interval the patient may be prescribed drinking-cures with the sodium chloride waters containing iodine and bromine.These waters are useful also for after-cures following vigorous mercurial treatment,and,finally,in the so-called tertiary stage of syphilis,in the presence of periostitis and exostoses.The best places for this form of treatment are Kreuznach,Hall in Upper Austria,Heilbrunn,Krankenheil,Lipik,and Ivonitch.Should the patient object to being sent for treatment to places which are well-known to all as specially frequented by the subjects of

syphilis,he may be ordered to take drinking-cures with the strong Glauber's Salt waters of Marienbad and Carlsbad.These have an influence in stimulating diuresis and intestinal secretion;for experience has shown that not only the increased activity of the skin,but also that of the bowels and kidneys,contributes to the successful treatment of syphilis and aids materially the effects of antisyphilitic remedies.As an after-cure following vigorous drinking- and bathing-cures by syphilitics,the internal use of ferruginous waters is at times advisable, as well as ferruginous peat baths and steel baths.In America thermal sulphurous waters may be taken advantage of at Calistoga Springs,El Paso de Robles Hot Springs, Santa Barbara Hot Springs in California;at Gelnwood Springs and Hot Sulphur Springs in Colorado;and at Salt Lake Hot Springs in Utah.The waters of Hot Springs in Arkansas are much used externally in the treatment of this disease;when used in conjunction with antisyphilitic medicaments,they tend to dispel the cachexia and improve vitality,and in this way increase the action of the drugs prescribed.Keller has fully investigated the effect of the brine bath upon,and it is largely through his warm advocacy that they have been so extensively employed in syphilis.They are composed of mineral waters containing sodium chloride in such quantity that the specific gravity exceeds 1050,and are available either directly or after previous graduation.The brine baths occur as natural or bored wells,or are prepared by washing out deposits of sodium chloride.They are derived in part from cold and in part from hot springs.They contain, of solid substances,principally sodium chloride,and,in addition to this,other chlorides,such as calcium chloride and magnesium chloride,and also sulphates,such as sodium sulphate,and only exceptionally are they charged with large amounts of gases,and then principally carbon dioxide.The concentrated brine waters are employed to obtain sodium chloride,and this is accomplished by boiling or graduation.The latter is effected by large,wide, long and high fences of interlaced faggots of thorns, from which the salt water drips and is then evaporated. The brine bath as used in syphilis is prepared with muriated water containing at least one and a half per cent. of saline matter.It is called a weak brine bath when it contains not more than two per cent.of saline matter, whereas a brine bath of moderate strength contains from three to six per cent.of saline matter.Concentrated salt waters,which contain a high percentage of saline matter, must be diluted when employed for baths.From the salt waters are obtained mother-lye,concentrated salt water, and brine salts;and these may be employed to strengthen weak salt baths.Mother-lye is the fluid that remains after concentration of the salt water by boiling,and contains,in addition to sodium chloride,other chlorine combinations,principally calcium and magnesium chlorides, as well as potassium,magnesium,and calcium sulphates, and iodine and bromine.It has a high specific gravity, and in general varies between thirty and forty per cent. of solids.Concentrated salt waters are likewise obtained by graduation.These containfrom sixteen to twenty per cent of salts.Brine baths are obtained by further concentration of the mother-lye,and contain the solid constituents thereof,and vaiyr only to a slight extent.It would appear that the influence of the brine bath depends,

leaving out of consideration the temperature,in the first place,upon the chemical irritation that the concentrated solution of sodium chloride exerts upon the skin and its nerves.This is indicated by increased tactile sensibility of the skin,by increase in the blood-pressure, by increased production of carbon dioxide;there is no characteristic effect exerted upon the pulse or respiration.Keller says that the three per cent.salt baths,at a temperature of 95.F.for a period of half an hour,causes a distinct diuretic effect,an inconsiderable increase in the chlorides,and a slight diminution in the elimination of nitrogen.Robin,however,affirms that a six per cent.bath diminishes the amount of urine,as well as the organic substances,the uric acid and the nitrogenous extractive substances,but increases the inorganic substances,the total nitrogenous elimination,the urea,the chlorides,the phosphoric acid,and the ratio between the phosphoric acid and the nitrogenous elimination.Beneke says that the simple salt bath,at the above-mentioned temperature and of thirty minutes' duration,causes very slight acceleration of metabolism.The effect is somewhat greater in the salt bath to which the mother-lye has been added,the elimination of urea being slightly increased;the increase,however,occurs only during the hours immediately following the bath,and the total metabolism undergoes no considerable quantitative alteration.Koestlin finds that salt baths,whether of four or twenty per cent.strength,exert no effect whatever upon the tissue changes,and cause no increase in albuminous metabolism. Nevertheless,the fact,based upon extensive experience, remains,that the brine baths exert an especially favourable influence upon chronic exudates,swellings of the lymphatic glands,and the relics of inflammatory processes.They cause also,as experience has shown,an increased demand for food,- as a result of which,increased assimilation and improvement of the patient's health occur. Suitable syphilitic cases can,therefore,with advantage take them.Baths of three percent.strength are usually employed,though a greater percentage may be prescribed should indications demand.Hot salt baths have the advantage of the heat,and of the presence of carbon dioxide;they are thus superior to the cold ones,which must be heated artificially for bathing purposes.The thermal brine baths are therefore specially indicated when it is desired to improve the nervous system,as well as the general nutrition of the patient;and they are accordingly indicated especially in the parasyphilitic affections. The amount of carbonic acid in these thermal muriated waters allows of their being used at a lower temperature than other brine baths,- 77.F.,for instance.Sometimes inhalations of the saline vapour is associated with the brine baths,for which purpose special rooms are provided at the bathing resorts,or the patients are allowed to breathe the air of the graduation rooms.Under the former circumstances the cold water is heated,and the vapour generated,together with the contained particles of saline matter,is inhaled;or at the thermal muriated springs the warm water is allowed to rise for some distance,and then like a fountain is cast into a resevoir,where it is broken into a spray,the entire room becoming filled with a dense mist saturated with saline particles.In the graduation house the salt water is precipitated, drop by drop,in large amounts,by day and night,and

impregnates the air with a greater amount of moisture and of saline matter.In this country cold brine baths may be had at Ashby-de-la Zouch in Leicestershire;Droitwich in Worcestershire;Harrogate in Yorkshire;Malvern in Worcestershire;Nantwich in Cheshire;Woodhall Spa in Lincolnshire;Llandrinddd Wells in Wales;and at Strathpeffer in Ross-shire.In America there are the Geuda Springs in Kansas;the Excelsior Springs at Benton Harbour in Michigan;the Moorman Mineral Well at Ypsilanti in Washtenaw County;Mount Clemens Mineral Springs in Macomb County; the St.Clair Springs in St.Clair County;and the Parker Mineral Springs in McKean County in Pennsylvania.In Germany there are cold brine baths at Arnstadt in Thuringia;Colberg in Pomerania;Dürheim in Baden;Elmen in Prussia;Goczalkowitz in Prussian Silesia;Hall in Wurtemberg;Heilbronn in Bavaria;Jatfeld in Wurtemberg;Juliushall in the Harz Mountains;Koesen in Thuringia;Koenigsdorf-Jastrzemb in Prussian Silesia;Koestritz in Reuss; Krankenheil-Toelz in Bavaria;Kreuznach in Prussia;Pyrmont in Waldeck;Reichenhall in Bavaria;Rosenheim in Bavaria; Salzungen in Thuringia;Suderode in the Harz Mountains; Sulza in Thuringia;Wittekind in Prussia.In Austro-Hungary they are located at Aussee in Salzkammergut;Gmunden in the same;Hall in Tirol;Ischl in Salzkammergut. In France at Salies-de Béarn and Salins.In Switzerland at Bex and Rheinfelden.In Italy at Vittorio,Rivanazzano, and Castrocaro.There are no thermal brine baths in this country,the waters of the cold brine springs being artificially heated for bathing purposes.In the United States there are thermal brine baths at the Black Sulphur Spring,and the Hot Salt Spring at Byron Springs in Contra Costa County in California;in Colorado,at Pagosa Springs in Archuleta County;in New Mexico,at Jemez Hot Springs in Bernalillo County;in Utah at Beck's Hot Sulphur Springs, in Salt Lake County,Salt Lake Hot Springs inSalt Lake County,Utah Hot Springs in Box Elder County,and Warm Springs in Salt Lake County.There have been numerous endeavours to artificially prepare brine baths.Thus three per cent.strength can be obtained by the addition of from fifteen to twenty-two pounds of common salt to ordinary water.Sea baths make good substitutes for the natural salt waters,also.Several writers speak highly of the efficacy of thermal calcium or lime baths in the treatment of syphilis,their utility depending chiefly in their high temperature,and to some extent,it is said,on the presence of calcium salts.But this view lacks confirmation and probability,as the only external effect of calcium salts is to desiccate the skin and diminish secretion.It seems to me that it is the temperature of the water which acts,not the ingredients of the bath.In this way the prolonged thermal bath exerts exerts a powerful effect on the skin through imbibition and maceration,acts as a sedative to the irritated nerves,hastens the healing process in open wounds and ulcers,and stimulates the emunctories.These baths can be taken in this country at Bath;at Ussat in France;at Bormio in Veltlin; at Buda-Pest in Hungary;at Leuk in Switzerland;at Lippspringle in Westphalia;at Szkleno in Hungary;and at Weissenburg in Switzerland.

HYDROTHERAPY.

Hydrotherapeutic measures have an important influence on the general course of syphilis,in which disease cleanliness is always indicated.A daily hot

bath should be taken with this object in view;it enables the patient to tolerate mercury better than would otherwise be the case.Hydrotherapy may be commenced with a sort of preliminary course,which consists in the employment of vigorous mechanical and thermic stimulation. Thus,cold frictions,cold shoer-baths,and half-baths are employed for from three to five days,being preceded,as a rule,by wet packs from a half to one hour,or steam cabinet baths.These are followed by the so-called major procedures,which influence metabolism in the most powerful manner and exhibit an active depurative and spoliative action.As a result of the disintegration of the body-proteid,the syphilitic virus,which is probably bound to this organic substance,is in successive quantities dislodged and thrown into the circulation,to be eliminated through the increased activity of all of the emunctories.Under these circumstances diaphoretic measures are to be recommended.One of the most vigorous of these is the dry pack,which acts by causing an accumulation of heat;another is the steam cabinet bath,which acts by supplying heat.The action of the mercury is not interfered with by these measures.Steam baths are used in such a way that the body,with the exception of the head,is exposed to the action of the vapour.A steam-tight cabinet is used,of which there are numerous models on the market.The steam is either generated in apparatus contained within the cabinet itself and is heated,or it is conveyed to the cabinet from a boiler outside.The best form is an upright steam chest of simple construction,the steam pipe emptying into the cabinet by means of numerous small openings.The patient sits upon a stool of adjustable height,with his head projecting from an opening at the top of the apparatus.A horizontal cabinet may be employed,if desired.Similarly constructed may be sweat cabinets with heated air.After two or three minutes in the cabinet the cutaneous vessels become dilated,and the surface of the body becomes warm.In five or six minutes sweating begins,often with redness of the skin;and this may be maintained for a long time and greatly increased by protracted exposure and continuous heating.The internal temperature of the body is increased,the action of the heart and the respiration are greatly accelerated,and the metabolism is augmented. Diuresis is influenced in accordance with the profuseness of the sweating;and if this be excessive,diuresis may be greatly diminished.The condition of the blood varies.At times there is a reduction in the corpuscles, but generally there is more or less marked increase, which,when the sweating is considerable,is probably an indication of inspissation of the blood.These changes involve not only the red corpuscles;the white are almost invariably increased.As a result of the sweating, reduction in weight occurs,even as much as even two pounds in the twenty-four hours.This is due to the loss of water.Toxins and metabolic products are eliminated. A temperature of 140.F.should not be exceeded.The patient soon becomes accustomed to bear the high temperature;it is important that the head be kept cool during the bath.During it the patient may be given liberal quantities in order to increase the sweating.The patient must be kept in the bath-room until the skin is cool again.From two to five minutes will be sufficient for the bath in most cases,though it may seem necessary

to extend the time.Mineral steam baths may be used;and the Turkish,Russian,and Irish-Roman baths may be recommended in suitable cases.The benefit of sea-bathing is undoubted and has already been referred to.Electric-light baths are largely used abroad,and appear to be rapidly securing a vogue in this country.

DIAPHORESIS.

The diaphoretic treatment of syphilis is highly recommended by certain competent authorities,and some of the measures for securing free perspiration have already been described.Pilocarpine is sometimes employed hypodermically in doses of a sixteenth of a grain.The patient should be put to bed between blankets,with hot bottles at his feet.Then he should be dreied of all sweat, and made as comfortable as possible for a sleep.Aural and ocular affections are said to benefit considerably from this method of treatment.

Zittmann's treatment is a special form of medication with diaphoresis in view,and,according to its advocates specially indicated in obstinate tertiary cases in which mercury and the iodides are without effect;it is, however,in just these cases that the more elegant arylarsonates are of service,so that there is every chance of the treatment being abandoned ere long.During the course of Zittmann's treatment the patient,except for an hour per diem,is kept in bed,his room being night and day at a temperature of 80.F.;but for his daily hot bath and responses to the calls of nature,he is a prisoner to his apartment,as it were.The night before the treatment is commenced,and thereafter every fifth day, the patient is given two pills consisting of calomel (gr.i.),extract.colocynth.co.(gr.iss.)and extract.Hyoscyami(gr.i.).The diet ordered is light,and includes boiled eggs,bacon,tea without sugar,vegetables,meat,fish, poultry and soup;but never fruits and spices.Zittmann has two decoctions - the strong decoction and the weak. The"strong decoction"is made up of sarsparilla-root - four ounces;and water - twenty-four pounds.This is digested for twenty-four hours,and has added to it a linen bag containing white sugar and powdered alum - of each two ounces; calomel - eighty grains;and cinnabar - twenty grains.The whole is simmered gently to a gallon; and then added fennel-seed and anise-seed(first brayed in a motar) - of each ninety grains; senna-leaves(cut fine) - one ounce; and liquorice-root - half an ounce. The mixture is allowed to stand for an hour,and is then pressed and strained;the patient is given a quart of it warm every morning.The"weak decoction"is prepared by adding two ounces of sarsparilla-root and twenty-four pounds of water to the dregs left after straining the strong decoction.This is boiled gently as before,for three hours,to a gallon,stirring meanwhile.Then must be added one ounce each of lemon-peel,cassia-bark,liquorice-root,and cardamom-seeds - the wholebeing allowed to stand for an hour and then strained.This weak decontion is taken cold four times a day,viz.,at 3, 4, 5,and 6 p.m.;whereas the strong preparation is given warm at 9, 10,11 a.m.,and noon.The patient is treated thus for fourteen days;and if there is not a marked improvement and if the general health is not deteriorated,the course is forthwith repeated,and then abandoned if unsuccessful.

Even in the absence of this complicated form of

treatment,SARSPARILLA is a useful medicament when taken along with mercury and the iodides;it can be pleasantly taken in effervescent form.

SULPHUR is an oldtime remedy,it combining with mercury in the system to assist its specific action and encourage a tolerance of the drug.It may be exhibited as the B.P.lozenge or confection;one or other of the sulphurous waters may also be employed.

GUAIACUM is a very old-fashioned remedy,and may sometimes be prescribed advantageously in a mixture with precipitated sulphur,ginger,and treacle.

SERUMTHERAPY.

Numerous attempts have from time to time been made to manufacture a serum capable of curing syphilis; but so far success has not been reported,though the future is not without promise in this respect.When we do secure an antisyphilitic serum the entire therapy of the disease will be revolutionised,and the benefit to mankind will of incalculable indeed - one of the greatest pests of the human race will be vanquished for ever.It is nowadays generally thought that microbes produce not only substances which act injuriously upon the system of the patient,but also certain products which are toxic to themselves,and which are able to render the system of the patient immune against new infection by the same organism.The immunising substance is found in the blood and tissues,and is excreted by the renal organs in certain cases.In the general evolution of syphilis there are not lacking reasons for believing that a similar substance may be carried either to the child through the mother's blood,or to the mother from the child infected by the father.Profeta demonstrated that an apparently healthy child born of a syphilitic mother could not acquire syphilis from the lesions of the mother.Colles and Baumes observed,vice versa,that a syphilitic child born of an apparently sound mother could not convey the disease to her.Bonaduce says that immunity to syphilis by filtration of protective serum through the placenta would result far more frequently than is the case were it not that through haemorrhages or traumatisms the indirect communication between the maternal and foetal blood is made direct,and not only the immunising substance,but the active living microbes,are carried from the diseased to the healthy human being,and thus syphilis is implanted instead of being protected against. There is a large production of the immunising substance which is filtered through the placenta;for when the syphilitic virus has once entered the foetus it finds every condition favourable to its development,and it is more prone to manifest itself in a severe form.The determination of the exact period at which this antitoxin is found most abundantly in the circulation is the difficulty in the way of the practical application of these facts.Moreover,the serum of the infected organism contains,in addition to immunising substances,certain poisonous compounds which act injuriously upon the tissues, lessening the resistance,and this encouraging proliferation of microbes.Bonaduce holds that if it were possible to accomplish artificially what nature does in the case of the mother,-that is,to immunise against syphilis,in accordance with the law of Colles,-the whole therapeutic problem of syphilis would be forthwith solved.Since the kidneys are functionless in intrauterine life,and since the microbe of syphilis exhibits

special virulence when it attacks the unborn child,there should be in the circulation of the latter at birth unusual concentration of both immunising substances and toxins.Heat may be employed to separate these from each other,since it is well known that the toxins are destroyed,while the antitoxins remain intact.In view of all this,Bonaduce drew blood from three children with all the characteristics of congenital syphilis.This was allowed to stand for a day on ice,and from it 35 c.c.of serum were obtained,to which 100 c.c.of sterilised water were added.This mixture was heated for ten minutes to 100.C.,and was filtered in the usual way.One of his patients,a man of 32 years,who had exhibited for eighteen days a characteristic chancre in the coronary sulcus,and whose inguinal glands were typically enlarged,received injections of this serum in the subcutaneous cellular tissue.These were administered with all aseptic and antiseptic precautions,and the injection fluid was kept aseptic.There was no inflammatory reaction excited.In all, twelve injections were given in the twenty-four days;at each injection about 10 c.c.were administered.We are told that during the course of this treatment the adenopathy subsided and that the ulcer grew steadily better,although no local treatment was employed.After thirty-five days the ulcer was healed and the inguinal glandular enlargement was markedly lessened.The treatment was continued for seven months,and when left off the patient was cured of his diseasewithout a single syphilitic mark or sign about him.The blood may be taken from the placenta of a syphilitic infant,or may be taken from persons who are at the height of secondary syphilis;but in all cases the serum should be employed with the most minute antiseptic and aseptic details.Tommasoli once proposed a method of treating syphilis,which consisted of the injection of serum derived from the blood of calves or lambs,the practice being based on the theory that these animals being immune to the disease,their body fluids must contain some immunising substance.Fournier claims a measure of success from the injection of serum from the dog and horse;and Pellizzari thinks that by the injection of the sypum of syphilitics who are in the transitional period between the secondary and tertiary periods of development,all secondary lesions may be prevented in those who are suffering from the primary lesion of the disease. Numerous successes are claimed from the injection of blood from animals maturally immune,or from injections of serum free from syphilitic toxic products,but supposed to contain the antitoxin of syphilis.Experience has shown,however,that little confidence ban be placed in these.The case described by Bonaduce is not conclusive, since the diagnosis of syphilis is by no means certain. Gilbert and Fournier obtained from the blood of two patients in the tertiary stage of syphilis,one suffering from tabes the other from gummata,sufficient serum to carry out the antitoxin treatment in one case.The subject experimented upon was a patient who had received no specific treatment.He was suffering from infecting chancres of the penis,characteristic inguinal adenopathy,marked anaemia,nocturnal headache,articular pains, and a diffuse maculo-papular eruption.He was given injections of the serum at intervals ofregularly for twenty days.About an ounce was used for each injection.In

all he received about ten ounces of the serum.With the exception of a slight roseola,all the syphilitic manifestations vanished.Duly encouraged by this,out authors devised a new method.They inserted under the skin of dogs and goats blood-serum,chancres,and excised skin eruptions taken from patients in the primary and secondary periods of the disease,hoping thus to increase the natural immunising powers of the blood of the animals treated.Contradictory results were obtained in the seventeen experiments thus conducted.Improvement is claimed by Cotterell in the eighteen cases of syphilis which he treated by the injection of blood-serum of syphilitics.Wassermann,Neisser,and Brück claim to have demonstrated the development of a syphilitic immune substance in infected apes;but it remains for the future to determine the value of this.Metchnikoff and Roux have conducted a series of experiments for the manufacture of a serum from monkeys also;but success has not yet been achieved.These animals were chosen not only because they were inoculable with syphilis,but because they furnish a serum which has little haemolytic action on the red cells of the blood.The results so far obtained would seem to indicate that the spironema is very fragile,and that it soon loses its virulence outside the body.It becomes inoperative at 48.C.,and it cannot pass through porcelain filters in the dry condition.Metchnikoff says that better results will be obtained when it is found possible to cultivate the casual germ in vitro.

MERCURY.

The use of mercury in syphilis is very long establishment.According to Rhazes,Avicenna,Mèsuè,and others, it was well known to the Arabs as a cure for the itch, pediculi,leprosy,and various skin eruptions,including the syphilitic.Celsus recommended it;and it appears to have been much used by Gilinus,in the fifteenth century, Torella,and many others in the form of an ointment.The drug,however,found it warmest advocates in Capri and Vigo.It was rather a dreaded medicament at first,and only fortieth to an eighth of the metal was contained in the ointment used by these early observers.The quacks of the time also used it largely;and,being careless of effects,they did much to bring it into discredit,the cure becoming worse than the disease.The patients,indeed, were sometimes actually killed by the drug,and those who survived remained exhausted by salivation,ulcers of the mouth,diarrhoea,and other toxic effects,or only recovered their health after a considerable period and great suffering.The discovery of guaiacum,in 1517,still further contributed to the unpopularity of the metal in this disease.Indeed,not a few observers blamed mercury for the production of the syphilitic symptoms,or regarded it as capable of so operating.Sixteenth-century writers inform us that the ointment of mercury caused such profuse salivation that the patients were in danger of losing their teeth unless care was taken to prevent that result.The throat,the palate,and the tongue became ulcerated;the gums swelled,the teeth became loose,and there flowed from the mouth a "very stinking secretion!" Consequently,the drug became recognised as a deadly poison,and there were few physicians of the time who dared to prescribe it.Though in the mooted times it was

almost universally deprecated,there were some who persisted in its exhibition;and in 1538 Ferri(De Ligno Sancto Liber,Aphrodisiacus,T.i.,p.404)announced that it was necessary to have recourse to mercurial inunction, owing to the frequency of failure on the part of the popular Holy Wood employed.Fallopius(Lib.de Morbo Gall., C.67)tells us that a young man had at last been cured by a quack whom he consulted;and,in view of this,that he always now used mercury in obstinate cases after the failure of more orthodox medicaments.Largely by means of his advocacy the advantage of mercury over guaiacum and various woods became recognised.It was at first only used externally:as an ointment,a fumigation,a liniment, or a lotion.Plasters were strongly advocated by Vigo. Mercurial washes were recommended by Ferrier,and composed of desiccating drugs and perchloride of mercury dissolved in distilled water.The sublimate was also used for washing and rubbing in a warm place all parts of the body except the chest,the head,the stomach,and the axillae,and that two or three times a day for ten days,according to the indications.The washes,however,produced much the same effects as the ointment,and were soon abandoned.The same remark applies to fumigations of mercury as then employed.The patient was first bled and purged,and then put into a well-warmed tent.At his feet was placed a pan of charcoal,and through a hole made for the purpose the fumigation substance was thrown at intervals,so that the patient was bathed in the resulting vapour and perspired freely.Should the patient by accident be seen to be on the verge of fainting,he was allowed to put his mouth to an air-hole specially made,or to suck in fresh air through a tube.Severe cases were kept a long time in the tent,and mild ones but for a brief period - from thirty minutes to an hour being the average duration of the séance.He was then taken out of the tent,put into bed between hot blankets,and allowed to perspire freely for an hour;after which he was rubbed dry,given a glass of wine,and two hours later a substantial meal.He was thus treated every two,three,or four days,according to the severity of the disease,until salivation and diarrhoea occurred or the symptoms showed marked improvement and a tendency to disappear.To Matthiolus,in 1535,belong the credit of having first given mercury internally;this he did in the form of the red precipitate.Others began to use metallic mercury internally - the favourite form of prescription being Barbarossa's famous pills,which one of the French kings, Francis I.,in 1540,was the first to use.Then came the advocacy of calomel,the black sulphide,the nitrate,and other preparations.Salivation.mouth ulceration,diarrhoea and other toxic symptoms were largely obtained from the heroic doses used,and the metal again became shorn of much of its popularity.According to Yvaren(la Syphilis), Chicoyneau,Chancellor of the University of Montpellier, pointed out the futility of salivation,and endeavoured to substitute for it a method of extinction.But it was only sixty years later that his idea was taken up and moderate doses employed,the whole question of the exhibition of the remedy being hotly debated meanwhile. There arose a school of antimercurialists,who maintained that it was no use whatever in syphilis,and that it undoubtedly tended to produce tertiary lesions,so

must be ousted from the therapy of the disease.Graves attributed toxic effects to mercury not unlike those of syphilis itself;Hunter held that new diseases arose from its exhibition;and Hermann and Baerensprung agreed that the metal deteriorated the constitution of the patient, favoured the development of destructive lesions,and was not necessary for the cure of the disease.There were numerous publications about the beginning of last century on the mercurial medication of syphilis;and so unfavourable were the reports that the antimercurialists gained numerous supporters,amongst them Thomson of Edinburgh who was a bitter opponent of the drug.Time was, however,sufficient to prove that mercury could not be done without;it soon came into favour again,and a better knowledge and appreciation of the drug obtained.The mode of administration was changed;smaller doses were given, and the heroic potions of ancient times abandoned - constitutional effects being comparatively rarely observed.Indeed,the metal is more popular now than ever;and there are some who prefer it even to iodide of potassium in the late stages of the disease.Mercury is still the specific remedy for syphilis,and,until a serum of a reliable and unequivocal sort is discovered,it will remain so.In short,despite modern therapeutic progress, mercury is still the sheet-anchor in the treatment of the disease;the slow,continuous,and moderate use of the drug,for a period corresponding to the maximum time of the normal duration of the disease as nearly as can be, without at any time producing its full physiological effects,will generally bring about a cure that can in no other way be accomplished.

That mercury is a powerful poison under circumstances of heroic exhibition a powerful poison is well known;wherever it comes in contact with albuminous substances it forms albuminates of a highly poisonous character.The soluble salts of the metal are more powerful than the insoluble,because they come into more intimate contact with the tissues and act more powerfully on them. It is a strong antiseptic and antiparasitic remedy;and one part in fifty thousand of water will destroy the lowest orders of the animal kingdom,while stronger solutions are lethal to bacteria.The soluble saltsconstitute the most powerful of antiseptics,and in the case of man also their destructive effects may be observed.When applied to the skin,the mercurial preparations,particularly the mercuric,give rise to irritation and the absorption of the drug employed.The amount of irritation varies with the quantity and particular variety of the medicament used in this way,and sloughing may result. Subcutaneous injections cause pain,swelling,and sometimes inflammatory reaction.Minute particles pass into the hair and sebaceous follicles,from which they are absorbed;after absorption mercury acts more especially on the alimentary tract and kidneys,although the other organs and tissues are by no means invariably spared.The salivation and stomatitis which occur so often under the exhibition of mercury are not due to the local action of the drug,as they are seen under all circumstances of excessive and unduly prolonged administration.Mercurial preparations taken into the stomach become converted into a complex albuminate,consisting of mercury,sodium chloride,and albumin,which is soluble on account of the sodium chloride present in that organ.The same thing

occurs when mercury is injected,so that sodium chloride is added to increase the solubility of the preparation employed.The drug also acts upon the intestines,especially the caecum and colon;and small doses of mercury given by the mouth produce soft motions.This action is apparently due to the long sojourn in them and the special affinity for the epithelium;this leads to the partial solution of the salts and to the development of their irritant action.Very little of the drug is absorbed,and most of it is thrown out unchanged by the stools.The remedy is supposed to act as an indirect cholagogue;but this action is more apparent than real,as there is no distinct clinical or experimental evidence that the liver is directly affected.The mercury may preserve the bile from intestinal putrefaction,and so warrant a suspicion of the occurrence of an increased biliary output.The kidney is also affected very markedly by the drug. A moderate dose of calomel induces marked diuresis,particularly in the case of dropsy due to heart disease. It influence upon the nervous system is not very well understood.It would seem that small doses of mercury are tonic,and increase the patient's weight and improve his nutrition.These small doses manifest their tonic effect in debilitated subjects by increasing the quality of the blood,in which liquid an oxyalbuminate is formed.In health the number of red cells is increased,as well as the percentage is haemoglobin at first,it is said;but afterwards diminished;in syphilis a fall in the amount of haemoglobin is succeeded by an increase to beyond that present before the mercurial treatment was commenced.Its action on the blood is of considerable practical interest,for the reason that by its use diametrically-opposite effects may be produced,according to the dose employed, the duration of its exhibition,the constitutional condition of the patient,and the stage of the disease.It has been demonstrated that large doses of the drug cause reduction of the red blood-corpuscles,and that small doses prevent their destruction.When,however,small doses are given during too long a period,anaemia is again observed.It has been further shown that small doses of mercury not only arrest the destruction of corpuscles due to syphilis,but actually cause an increase,which steadily progresses until a normal proportion is attained,as long as the small doses are administered.Large doses are found to have an opposite influence,being distinctly debilitating.It has consequently been observed that in syphilitic subjects,as well as in healthy persons,and in whatever way administered,mercury always gives rise to an increase in blood-corpuscels,provided an intercurrent gastric disorder is not present or the toxic effects of the metal unproduced.The onset of salivation,etc.,marks the beginning of a decrease in the number of cells.Semmola(La Presse Méd.,Sept.15,1889) has given very patient study to the amount of haemoglobin present in syphilis in relation to the benefit derived from mercurial medication.He found that if a syphilitic subject has no treatment,the quantity of the haemoglobin in the blood will diminish from time to time; that if mercury be given to animals or persons not suffering from syphilis,the amount of haemoglobin will be decreased in a few days;that if a syphilitic individual who shows that the amount of haemoglobin is diminishing be put on a mercurial treatment,an increase in the

amount of haemoglobin can be determined at once,and very markedly in the course of seven or eight days;from these facts we have a valuable indication as to just when the mercury ceases to do good,and therefore should be abandoned.Kuperwasser(Arch.des Sci.Biol.de St.Pet.,Vol.i., 1898)found that leucocytes,-which all arise from one and the same element,namely,the small mononucleated lymphocyte,-being classified into young,mature,and old leucocytes,the blood of healthy subjects was modified by mercury in that the proportion of young leucocytes present is considerably increased and that of the old considerably diminished.The blood of syphilitics reacts to mercury by a considerable diminution in the proportion of young and a corresponding increase in that of old leucocytes.This reaction is independent of the stage of the disease,and takes place whether they are at the time syphilitic manifestations or not,and also whether the patient has or has not previously been subjected to specific treatment of mercury and iodides.Those who have undergone treatment by mercury within four months of applying the blood test form the only exception to the rule. In such cases the reaction of syphilitic is replaced by that of healthy blood,possibly because the patient still retains a considerable quantity of mercury,or because under its influence the disease has become so attenuated that the blood gives a normal reaction.Some of the earlier writers mention having observed a diminution in fibrin, and as a result an abnormal fluidity of the blood that predisposed to haemorrhage.Lowering of the rate and tension of the pulse and of the temperature,sometimes of nearly two degrees,was also noted:all poiting to the fact that excessive doses of the drug had been administered.Maurel(Bull.Gèn.de Thèrap.,Mar.15,1893)says that perchloride of mercury,in high toxic doses,has a malign influence on both the white and red cells of the blood. In small amounts it affects the white corpuscles more markedly than the red ones.The minimum fatal quantities for the organism correspond to the smallest amounts necessary to destroy the leucocytes;the same relation exists in regard to the largest quantities tolerated by the economy and those which are borne by the leucocytes;and it may be affirmed that at present there is no histological element so susceptible to the influence of mercury as the blood-cells of mankind.Great disputation has for long existed as to the method in which mercury is absorbed and eliminated;some observers maintain that the single dose of mercury does not remain in the system,but that it accumulates in the tissues when the drug is exhibited constantly for some time,as elimination does not keep place with absorption.Various authorities have shown that the drug applied to the skin can be tracted microscopically as far as the bulbs of the hair,where it was until within comparatively recent years to become metamorphosed into perchloride of mercury.The same chemical transformation was believed by numerous writers to occur in the intestinal tract.In the presence of albuminous substances the new salt was credited with the power of forming an insoluble albuminate,which became soluble in the presence of sodium chloride.In time,however,there were published researches to show that the extreme power of volatalisation of mercury,-according to Merget it has an initial molecular velocity of one hundred and eighty metres per second,-and the theory has been advanced that in its normal or metallic state it penetrated

the cutaneous and intestinal mucous membranes(Jullien.-Veneral Diseases,p.1161.- Citation of Rabuteau).The protoiodide,for instance,would become transformed into metallic mercury and biniodide,the latter in turn being decomposed and giving rise to the iodide of sodium found in the urine;calomel would yield pure mercury and the perchloride,which in turn would slowly be converted into chloride of sodium and metallic mercury in the blood. Thus,any preparation of mercury would finally yield its original element.This theory,according to Jullien(loc. cit.),is sustained by clinical experience.He alludes to the many instances in which metallic mercury has been found in various tissues,such as the bones,the contents of abscesses,and so forth.Vajda and Paschkis and Sigismund have studied the subject of the accumulation of the drug in the system,and affirm that they found it in the urine thirteen years after cessation of mercurial treatment;but Schuster attributed this result to faulty technique in the case of the first observers and to constant exposure of the subject to diffused mercury,as in the case of Sigismund.Still,Schuster himself found it in the faeces months after the mercurial medication had been abandoned.Ullmann(Inter.klin.Rund.,Sept.25,1892)says that in the exhibition of the insoluble salts of mercury the metal may be found in the following organs,those containing the larger amounts being first:kidneys,liver, spleen,then the intestinal canal,-which contains an increasing proportion from the upper part downwards,- and in small amounts in the heart skeletal muscles,and in some cases in the lungs and in the blood collected in the larger vessels and the aorta.The method of exhibition will determine the elimination of mercury.Byasson and Betelli found mercury in the urine and saliva two hours after ingestion.Riegerer obtained,from the faeces of a dog,seventy-seven per cent.of the quantity administered during thirty days,and from the urine of the animal one percent.The brain,heart,lungs,spleen,pancreas, testicles,penis,muscles,and liver were all found to contain the drug:the liver the most and the muscles the least.It has also been found in the milk of nursing women,and their nurslings,and in the semen.A single dose of mercury is,however,completely eliminated,according to the experiments of Magencon and Bergeret.Balzar and Klumpke(Rev.de Méd.,April,1888)tell us that after a single dose of mercury its elimination is rapid,and sometimes complete in twenty-four hours;but if a continuous treatment is interrupted,its excretion is continued for some time;and Küssmaul and Gorup-Bésanez have found it in the liver as much as a year after its administration had been stopped.The amount of mercury that can be steadily eliminated for many weeks from the kidneys,when the body is saturated,is about a sixteenth of a grain.The practical conclusion drawn from these researches is that it is well to stop the exhibition of the drug when the amount eliminated by the urine had reached its normal maximum.It was long ago demonstrated that the metal has the power of inducing fatty degeneration and elimination of inflammatory products,or of relieving tissues encumbered with superfluous and obstructive material.This condition of the tissues is precisely what exists in syphilis,and as mercury is the best remedy at our command for the correction of such a pathological state,irrespective of etiology,it should be administered

throughout the natural course of the disease - not to antidote a poison, but to remove the morbid results produced by it, as fast as they are formed, until finally the syphilitic impression upon the organism has naturally exhausted itself. The infection of syphilis, it is well known, practically consists in the influence of infection on healthy cells, causing their rapid proliferation and obstructive accumulation. It is a noteworthy fact that every method of treatment for syphilis that has been advocated for the last two or three centuries has comprised such measures as tend to produce rapid tissue-changes, and more especially elimination. The sweating-cure, the use of hot baths, the purgation and starvation cures, Boeck's method of syphilisation, and the treatment by pustulation with tartar emetic, all of which have been recommended by various writers at different times, are chiefly active through their power of inducing fatty changes in the tissues. In the various methods of hydrotherapy the benefit is secured by inducing elimination. In view of the toxins elaborated by the spironema, this is worth bearing in mind. Some of the earlier obsevers noted that, even in the case of healthy individuals, very small doses of mercury led to an increase in weight - the fact being confirmed by animal experimentation. Schlesinger, for instance, gave the drug to sheep, rabbits, and dogs; and after exhibiting perchloride of mercury for a whole year, he noted that all the animals, especially the dogs, so treated had gained in weight and that there had been a marked increase of red cells, while all the untreated control animals did not present these changes. He contended, however, that the increase in weight being due to an increase of fat, the only conclusion warranted is that a diminution of oxidation occurs, the result of restricted protoplasmic metabolism, the red cells increasing merely because the destruction was curtailed. The tonic effects of mercury would thus, he says, be but apparent; were they real, an elevation of temperature and an increase of organic changes would be present. To this some objected that the theory rests upon supposition rather than upon demonstrated facts, there being much clinical testimony to sustain the assertion that exceedingly minute doses of mercury benefit mutrition. The fact that Boeck found an increase, though slight, of nitrogen in the stools and urine, tends to support the idea. Welander holds that the elimination of the drug through the kidneys is attended by more or less temporary irritation when the drug is administered for some time. Casts were found in the urine in all of his ninety-seven cases, in proportion to the length of the treatment, gradually decreasing after cessation and disappearing within a month or six weeks. It is well to bear in mind, however, that his data are based upon observations in syphilitic cases, and that the affection may have much to do with the phenomena observed in connection with the renal organs. Fürbringer (Med. Week, July 13, 1894) has noticed that syphilitic individuals undergoing mercurial medication often show signs of inflammation of the kidney; out of one hundred cases eight developed albuminuria in consequence of the absorption of the drug; these cases always recovered on the cessation of the treatment in question. Winternitz found that the preparation employed had no special action in itself

on the quantity of urine.His experiments included the insoluble salts,calomel,salicylate of mercury,and the soluble preparations.A parallelism between the quantity introduced and the curative effect was shown by the quantity excreted,whether the mode of administration was by the mouth,subcutaneous injection,local inunction,or plaster.Mironowicz(Vratch,Vol.xx.,No.28,1899)has studied the elimination of mercury in twenty-eight cases.According to him,it is eliminated by the sweat as well as by the urine;when mercury is introduced into the system in quantity,the elimination is increased,but with cessation of the drug elimination is diminished;mercury is eliminated by the skin in larger amounts than is supposed,the eliminated amount depending upon the amount of sweat;during inunctions mercury is pressed in the glandular ducts,whence it is removed by the perspiration;by forced sweating the remaining mercury can be removed from the body of the patient.Schuster,who found mercury in the faeces twelve weeks after abandonment of the treatment,holds that the intestinal tract is far more active than the kidneys in the process of elimination,and that mainly through this means the system,as a rule,is relieved of its mercury six months after an average course of treatment.In poisoning by mercury he finds that the intestinal tract seems to bear the brunt of the attack,especially the large gut.Pilliet and Cathelineau found extreme congestion of the vascular network,with necrosis of the glandular network,in this situation.Fraenkel found that the inflammation,even when mercury is used externally,attacked the large intestine and the ileum only in rare instances.Sawadsky(Jour.des Sci.Med.de Lille,Mar.16,1888)finds that calomel has a marked disinfectant action on the intestinal canal,which depends upon the transformation of the drug into an oxide of mercury through the influence of the bile and the alkalies of the intestinal canal.Audry(Lyon Méd.,April 15,1888)has prepared anatomical specimens from a patient who had received hypodermic injections with metallic mercury.The intestines were dotted with numerous ulcers and diphtheroid thickenings,and the kidneys were of the small,white type.Ottolenghi(Gaz.Osped.,1897,No. 1)says that when calomel is given,even in therapeutic doses,and the patient is then made to drink saline or chlorohydrated water,much more rapid and intense symptoms are induced than when the calomel is given alone;in these cases it is probable that the calomel acts while going through the albuminoid substances of the body,it irritating the digestive tube and giving rise,in the first place,to diarrhoea and vomiting and afterwards to alterations in the mucous membrane;this toxic and irritating action of the calomel is,however,he says,principally observed when it is in contact with substances which render it more soluble and more absorbable;among these substances chloride of sodium and hydrochloric acid, associated with various albuminoid substances,come first in order;these substances do not act by chemically transforming the calomel into the more toxic agent perchloride of mercury,but simply by making its absorption en masse more easy of occurrence.

It is the specific action of mercury upon the spirochaete pallida that is responsible for its curative action in syphilis.Further,it seems likely that the drug acts indirectly by causing a production of

alexines,which are substances produced in the blood and have the power,it is said,of neutralising the morbific agent.The system of the patient plays an important role in the accomplishment of a cure,and seems to manufacture an antitoxic substance.The value of the drug in this disease is well established,though perhaps a very few of the old school of practitioners consider its claims by no means well founded.

In view of the possibility of the toxic or physiological effects of mercury in certain cases,it is necessary that every prescriber should be thoroughly conversant with their nature.Patients exhibit considerable variation in their susceptibility to the drug,some taking it with apparent impunity,and others salivating,etc., with even small doses.Salivation means overdosage,and may be seen with any preparation.The symptoms of mercurial toxicity are quite characteristic.There is at first a disagreeable metallic taste in the mouth,the breath of the patient is foetid or almost putrefactive in odour,the gums are sensitive,and when the jaws are forcibly closed slight pain is experienced.At the same time the saliva becomes more abundant than normal.If as soon as these symptoms appear the administration of the drug be not stopped,as should always be the case, the gums become spongy and bleed easily;the tongue swells, and the flow of saliva becomes excessive,constituting the condition known as ptyalism.If the gums be examined, a dark line will be found at their junction with the teeth.The parotid and maxillary glands are usually enlarged and tender,and slight pyrexia may be observed. Woodbridge(Occidental Med.Times,March,1891)described the occurrence of catharsis and ptyalism after the exhibition of two- to three-grain doses of the yellow subsulphate of mercury,given to produce vomiting in a child of three years.Walker(Brit.Med.Jour.,Nov.28,1891)reports a case in which ptyalism was produced by the local application of black wash;and Krotoszyner(Occid.Med.Times, March,1896)one in which less than two grains of calomel caused a child to salivate.Various destructive lesions are observed if the exhibition of mercury is continued after the development of the above-mentioned preliminary symptoms.Ulceration of the mucous membrane,soon invading the deeper tissues,looseness and loss of the teeth,necrosis of the jaws,copious haemorrhages occurring through ulceration of the vascular coats,follow in more or less rapid succession,and the patient dies of exhaustion.It is,however,seldom that such a result occurs nowadays.The cases of mercurial poisoning usually met with are generally due to insufficient instructions to the patient, who continues to take the medicine without reporting the occurrence of unpleasant symptoms to his medical man. It now and then happens that the skin is first to show the mercurial manifestations,an eruption resembling that of scarlet fever being the most frequently observed.The patient not infrequently suffers severely in this way. Robinson(Med.Analectic & Epit.,Aug.,1890)describes the case of a middle-aged syphilitic,in whom mercurial inunctions were followed by severe ptyalism,painful tongue,loosened teeth,foetid breath,a papular and pustular eruption accompanied by intense itching,and a purpuraceous desquamation.The temperature rose to fever-height, and there was produced also anorexia,tremor,albuminuria,

and other symptoms.The patient finally recovered under proper treatment.He exhibited,some time later,the same train of symptoms after the administration internally of ten grains of calomel divided into four doses.The eruption now was of a miliary and scarlatiniform character.Fordyce(Jour.Cutan.& Gen.-Urin.Dis.,Dec.,1895)tells of the occurrence of erythema scarlatinoides following the application of mercurial ointment to the public region,the medical attendant diagnosing scarlet fever from this;within a week there followed abundant desquamation from the entire body,especially profuse on the hands and feet;at no time was there an elevation of temperature,nor was the throat affected.Camescasse(Bull. Gèn.de Thèrap.,1898,p.20)reports the case of an elderly lady who received five doses of two-thirds of a grain of calomel,at three hours' interval,on alternate days for a week.The patient was put upon a milk diet,and received a simple enema every morning.Moderate purgation and considerable diuresis ensued,with consequent diminution of anasarca and dyspnoea.Upon the day following the first day's use of the drug there was noticed a slight burning over the entire body,but especially over the face,neck,and hands.Redness appeared on the second day.At the end of the week the burning was torture;the entire surface of the skin was scarlet-red,violet in places,swelled,and thickened.The hairy scalp remained uncoloured.The palms and soles were less coloured than the other surfaces,but yet were red.In a few days spontaneous cure appeared,but accompanied by an abundant and extraordinary desquamation,which extended to the hairy scalp and to the mucous surfaces.First large surfaces were detached,then small scales,and finally a whitish powder.This process lasted for a fortnight,although the mucous surfaces were healed at an earlier date.The temperature was not raised,nor did the redness of the mouth resemble a stomatitis of mercurial origination.Pflüger (Arch.f.Derm.u.Syph.,lx.,p.425,1902)mentions a case of localised gangrene following an extremely painful intramuscular injection of the bromide of mercury.Brocq has reported a similar result after a painful injection of the bromide,and Lesser had gangrene occur after two injections of corrosive sublimate,which were followed by profuse bleeding.Lesser ascribes the condition to the injury of a large artery,while Brocq attributes the gangrene to direct injury to an important nerve.To prevent the occurrence of salivation and stomatitis the utmost care should be given to the toilet of the mouth; all sources of irritation should be avoided.Decayed teeth must be extracted or stopped,the gums must be kept perfectly aseptic,and smoking must be strictly prohibited. Mouth washes should be prescribed for diurnal employment.The patient's diet must be light,nutritious,and easily digested,and fresh air and exercise should be freely allowed.The patient should report himself as soon as the notices increase in his saliva or sore and swollen gums.On the occurrence of salivation a modification of the diet,a reduction in the amount of mercury, a restriction of the fluids consumed,and carminatives may be ordered.If these measures are ineffective,the exhibition of the drug must be stopped.The teeth must be brushed once or twice a day with a solution containing equal parts of tincture of myrrh and tincture of iodine;and the mouth should be rinsed out after each

meal with a solution of potassium chlorate, alum, boric acid, or other antiseptic and astringent. The patient should be given some chlorate of potash lozenges to suck. The horrid odour of the breath may be alleviated by the use of a weak carbolic mouth wash, a solution of phenate of soda, or chlorinated soda solution. Severe salivation may require the exhibition of a ~~hundredth~~ and thirty-second of a grain of atropine with sugar of milk. Ulcers call for cauterisation with nitrate of mercury or lunar caustic. After the cure the patient should have a course of tonic treatment before the administration of mercury is resumed. I have noticed that enteritis is more liable to occur when the mercury is orally administered than by any other method; this is due to the action of the metal on the intestinal wall and its elimination by the bowels. The stomach is affected as well, and the condition produced is really a gastroenteritis. The patient is anaemic, and complains of anorexia, sickness, vomiting, and a feeling of weight and discomfort in the stomach; colic and diarrhoea (sometimes mucous or haemorrhagic) then appear. In these circumstances the exhibition of the drug must be abandoned and the patient properly dieted. Bismuth, Beta-naphthol, salol, and opium are the drugs indicated for the relief of this condition. A useful mixture would be one composed of carbonate of bismuth (gr.xv.), salol (gr.v.), compound tragacanth powder (gr.v.), solution of chloroform (m.v.), and chloroform water to an ounce for three-hourly exhibition. Lead and opium pills, and compound ipecacuanha powder may also be prescribed. Skin eruptions are sometimes seen under administration of mercury by the mouth; sometimes no other symptoms of the toxic action of the drug are observed, except perhaps pyrexia and general discomfort. These eruptions vary greatly in form, being erythematous, eczematous, or urticarial; they be be seen singly or all flourishing at the same time. They last for one to three weeks; but in some instances they are present for months, and relapses are now and then observed. The exhibition of the drug must be at once suspended, and lotions or ointments applied according to indications. The occurrence of mercurial nephritis should always be carefully watched for, and the urine be frequently examined during the time that the patient is taking the drug. Any pre-existing nephritis makes the patient a bad subject for mercury, and contraindicates its exhibition except under the most careful conditions. Another toxic symptom of mercury is what is known as mercurial cachexia - a condition which resembles scurvy. In it there is marked anaemia and loss of flesh, alopecia, general loss of power and all the local manifestations of mercurial toxaemia, such as foul breath, diarrhoea, and a dark coloration of the skin. The presence of rheumatism is sometimes, moreover, suggested by the occurrence of excruciating pain in the bones and articulations.

There are certain conditions which either contraindicate the exhibition of mercury or the exercise of great care in handling it, though there is really no absolute contraindication to the occasional employment of the drug. In the presence of Bright's disease, we have seen, it must be administered with the utmost precaution, the blood and urine requiring frequent examination. The same remark applies to the presence of infectious fevers,

tuberculosis,and other debilitating affections;in tuberculosis the drug should be lessened in dose and be combined with the iodide of potassium;during infectious fevers it must be entirely abandoned.

Mercury may be given only to cause disappearance of actual symptoms;interruptedly in periods of varying length,with intervals of complete rest between;or it may be administered continuously over long period of time.The first-mentioned method is called the modified expectant plan of treatment;it has little to commend it, if we accept the microbic theory of syphilis,if we admit that the effects of the disease are widespread and permanent,and that these effects are dependent largely upon the relation between the original dose of the microorganism and the resisting-power of the normal cells,and if we also believe that the drug has an inhibiting or lethal effect on the spirochaete pallida.The secondmentioned method is called the interrupted plan of treatment,and calls for consideration in view of the fact that it was warmly advocated by Fournier.He,however,it seems,has frequently changed his method;and this apparently shows that permanent cures have not been forthcoming from its employment.Some writers hold that the time to eradicate syphilis is at the beginning of the attack,when vigorous mercurial treatment is best tolerated and is most efficient.If the treatment is pushed for about six months they believe that most cases will be found on their way to fecovery,and may then have a rest in the absence of lesions and if the general health of the patient is well maintained.After a month without specific treatment a course of inunctions,or a combination of mercury with small doses of potassium iodide, is by these observers given;they argue against plan of treatment on the ground that mercury taken by the mouth induces a condition of tolerance and after a time fails to fulfil its purpose.The third method is the continuous plan of treatment;it is the most rational of all,and the one most generally in vogue.Mercury is administered without interruption for a period varying between one and three years,and in as full doses as the patient can tolerate without prejudice to general health.It is advisable,some assert,to use the same preparation of mercury throughout the treatment,the dose being regulated by the patient's susceptibility.Beginning with the protoiodide,for instance,a third of a grain thrice daily,this quantity is gradually increased till slight toxic symptoms develop.The first symptoms caused by full dosage of the protoiodide may be griping pains in the abdomen and several watery stools in the day.When other preparations of mercury are given,and often with the protoiodides,foetor of the breath,hypersecretion and ropiness of the saliva,and slight tenderness of the gums may be the first indications that the drug has been pushed to the limit of safety.When it is thus determined how much of the mercurial preparation of choice the patient can safely take,providing the symptoms of impending salivation are slight,the full dosage is continued a short time until the more active manifestations of the disease have been combated;it is then cut down one-half,and this lessened dose,or one-half the quantity required to produce salivation,is the quantity the patient must take during the greater part of the mercurial course.After the limit of toleration has been

determined,if the symptoms are not active,the patient is given a rest of several days,until the constitutional symptoms of the drug have quite disappeared;he is then prescribed half doses,and this is continued for perhaps as long as three years.Consequent on the discovery of the specific germ,medical opinion is decided as to the necessity of early treatment,which is now commenced at a much earlier date than heretofore.

In the case of women smaller doses of mercury are required;for they are somewhat liable to gastric disturbances under its exhibition,and they not infrequently suffer from a high grade of anaemia and various pains from excessive doses.

There are several ways in which mercury may be administered,each having their advocates.Theyare all more or less efficient,and fulfil various indications.The essential of the mercurial course is that the drug shall enter the circulation and so gain access to the diseased tissues,and any method which provides for this without marked disturbance of the general economy will do.Most practitioners prefer the oral method as being simplest and most convenient;its popularity is as great as ever. To it may be objected the fact that it is one of the least efficient of methods,and that not infrequently it gives rise to gastrointestinal derangements.

Under the oral method of mercurial medication the patient requires to be seen only at intervals,and he can be treated with the usually always-desirable decrecy. Most syphilitics in this country take the drug by the mouth;but there are some calling for other modes of exhibition in view of the refusal of the stomach to absorb the remedy in whatever form prescribed.The preparations of mercury employed are both numerous and varied;as one may suit one patient and not another the element of routine must be eliminated from the therapeutic plan and each case treated accoding to its particular demands.Gray powder,mercuric iodide,and the blue pill are perhaps the best of all mercurial preparations for oral medication;and in all cases it is better to give a series of small doses than one large dose at a time. In tuberculous subjects the remedy is badly borne,and it should then be combined with one or other of the iodides to meet the indications of the case.Hydrargyrum cum creta,mercury with chalk or gray powder,is a fine triturate of metallic mercury,there being present in it thirty per cent.of metallic mercury and fifty-seven per cent.of prepared chalk.Each grain of gray powder contains about a third of a grain of mercury.It is an excellent preparation and one of the least variable of them all.In this country it is enormously popular,and,on the whole,it gives as good results as any other form of the drug.It may be given as a pill,in tablet form,or as the simple powder.Tablets and pills are very convenient and largely used in the case of adults,while the powder,in doses of a half to two grains,is mainly prescribed for children. Theinitial dose of gray powder is one grain three times s day,the dose being gradually increased to the one necessary to cure the patient without the production of toxic symptoms.Six grains a day can usually be taken without discomfort,and to each dose a grain of Dover's powder may be added to counteract its occasional disagreeable effects.It has much the same properties

as the blue mass or pill;but it acts more mildly and is therefore considerably used in the treatment of cases with gastrointestinal sensibility.Blue pill,or blue mass, is a favourite and efficient preparation of mercury. In it the mercury is triturated with the excipients until the metallic globules are no longer visible under a microscope magnifying ten diameters.The mass thus prepared contains thirty-three per cent.of mercury.The dose is from one to ten grains.The familiar blue pill should contain three grains,but this dose is sometimes exceeded. It is,however,more liable to attack the gums than the gray powder,and it therefore is not so suitable for general exhibition.It is usually prescribed in the later stages of syphilis,although it may be given from the very outset of the disease.It is best to begin with one-grain doses,three times a day,and increase the quantity by a weekly grain until the maximum desirable dose is reached. To secure the best results,it should be freshly prepared and coated with sugar;should it give rise to gastrointestinal discomfort,aromatics may be combined with it. Diarrhoea is relieved by the addition of half a grain of Dover's powder to each grain of the pill;a quarter of a grain of opium to every two grains will do as well.Four grains of the pill per diem are usually sufficient.Keyes (Syphilis)advises that the drug should be pushed until the gums are touched,and says that half of the amount necessary to do this is the tonic dose and should not be exceeded unless otherwise urgently demanded by indications. The green or protoiodide of mercury is much used in the treatment of syphilis,in doses of from an eighth to a quarter of a grain.Its popularity abroad is very great,and it is said to be the most suitable mercurial for employment in hot climates;it has,however,never replaced gray powder in this country.Fournier has great faith in its efficacy.A scruple of it may be combined with a sufficieney of confection of roses to make sixty pills,and the patient be directed to take three of these on the first day,four on the second,five on the third - the dose being increased by one pill daily until some characteristic effect of the drug is seen.While thus pushing mercury for the purpose of discovering the full dose,the patient must be seen at least every second day, and there must be some standard adopted by which his susceptibility to the drug may be determined,that is, some sign of its physiological activity must be manifested.The condition of the mouth and gums will clearly indicate the patient's reaction to the drug.Mild colicy diarrhoea is frequently considered a sign that the full dose of mercury has been reached;this symptom,however, shows only the reaction of the intestinal mucous membrane to the particular preparation of mercury that is being used.Colic and diarrhoea may occur long before enough mercury has been given to influence the gums,or even enough to influence the course of early syphilis. These symptoms indicate defective absorption of the drug,and show that only a fractional part of the daily dose administered is reaching the general circulation; consequently,the adoption of colicy diarrhoea as a guage of constitutional susceptibility may lead to error,and may result in insufficient treatment and all its untoward effects.If during early treatment with mercury colic and diarrhoea make their appearance before

the first symptoms of ptyalism, the protoiodide should be suspended from exhibition, and in its place gray-powder pills should be given. These pills are given in exactly the same way as those of the protoiodide, increasing steadily until the limit of tolerance, that is, the minimum dose necessary to produce toxic symptoms, is determined. A grain of gray powder produces somewhat a more powerful effect than the third of a grain of the protoiodide. The red or biniodide of mercury is seldom given by the mouth, as it is too apt to produce toxic symptoms. It is a scarlet-red powder devoid of odour and taste; it is practically insoluble in water, and slightly soluble in alcohol; the dose is from a thirty-second to an eighth of a grain. Salicylate of mercury is recommended by not a few syphilologists; it is given in pill form, each pill containing from a sixth to a quarter of a grain, one pill being taken thrice daily. Calomel is not much used for the internal therapy of syphilis. It is a tasteless, white, impalpable powder, insoluble in water and alcohol. Its dose varies from a quarter to ten grains according to the disorder treated. When given internally, the pill known as Plummer's pill may be employed. This preparation contains one part of calomel in four and a half parts, from four to eight grains being the dose. Corrosive sublimate - mercuric chloride or perchloride - is an efficient and most useful preparation. It is prepared by subliming the bibsulphate of mercury with chloride of sodium. It occurs in the form of transparent, whitish crystals, of a metallic acid taste, and is soluble in sixteen parts of cold and two parts of boiling water and in three parts of alcohol. Its dose varies from a hundreth to an eighth of a grain. According to Michaelis (Zeit. f. Hyg., Aug. 23, 1888), sublimate solutions should be kept in brownish-yellow bottles, in order to prevent the decomposition which ordinary light gradually produces. Hills (Bost. Med. & Surg. Jour., Feb. 21, 1889) says that corrosive sublimate undergoes chemical change when in contact with organic matter, and is immediately converted into an insoluble albuminate; a small quantity is soluble in excess of albumin, but is likely to be at once decomposed, in masses of excreta, into the insoluble sulphide by the sulphuretted hydrogen present. According to Burcker (Arch. de Méd. et de Pharm. Milit., April, 1895), ordinary water causes an immediate decomposition of corrosive sublimate, which decomposition steadily continues under the influence of light and air; it ceases or becomes arrested when the air and light and excluded; solutions of perchloride of mercury made in distilled water undergo only trifling decomposition, even when exposed to light and air. In syphilis its use is practically confined to the later stages of the disease, being administered in the form of the officinal solution in drachm doses three times a day with iodide of potassium. The liquor hydrarg. perchlor. contains a sixteenth of a grain of corrosive sublimate in the dose named. Tannate of mercury is highly recommended by certain writers as a good, though irritating preparation. It is, however, very variable and unstable, is less efficient than the above-mentioned preparations, and is unsuitable for routine administration. It is usually given in half-grain doses, combined with an equal quantity of sugar of milk or hyoscyamus.

The treatment of syphilis by injections is now immensely popular, and even general practitioners in

remote districts are using them with success.They were introduced by Scarenzio in 1864,but not generally adopted until within comparatively recent years.Some of the Metropolitan practitioners have used them for a long time and are as strongly in their favour as ever.The alleged dangers of the method for long interfered with their popularity and contributed to the well-established oral vogue.There is no doubt that the injection of mercury is not unattended with danger;but this fact has been made far too much of.Lambkin(Brit,Med.Jour.,Aug.19,1899) says that the treatment of syphilis must be long continued,for eight months or one year,and that it is certain that most of the cases in the British Army and Navy do not receive treatment for nearly so long as this;by the intramuscular method treatment may be continued as long as necessary after leaving hospital,the men coming up for treatment once a week;our author has given twenty thousand injections without a bad result,except in one case in which an abscess formed;he prefers the following prescription,as it causes but little pain - one drachm of mercury,two drachms of lanoline,and four drachms of 1 in 20 carbolic oil,of which ten minims are injected into the buttock.Since then our author,I understand,has given over fifty thousand injections with equally good results.Balzer(Cited by Marshall. - Syphilology and Venereal Disease)Holds that subcutaneous injection causes the immediate absorption of part of the mercury and its transformation in the tissues and blood;a residual part remains at the site of injection,combined with the serum of the blood in the form of an albuminate,and is absorbed slowly later on;a part is fixed in the viscera, and a part is eliminated by the renal organs.There are numerous advantages of injections which vastly outnumber the disadvantages.They are easy of administration and insure the entrance of mercury into the system. In the tropics no other method is so suitable,and they do not debilitate the patient.The dose is graduated,and on that account the method is a certain one.A great point in their favour from the patient's standing is that he can be assured of the secrecy of the treatment.When enteritis,inflammation of the liver,pneumonia,angina,and the failure of oral administration and inunction demand mercury in some other form,injections are very valuable. They are also extremely efficient in syphilis of the eye and nervous system,and also in cases of severe syphilodermata.They are the best means available of carrying out a therapeutic diagnosis.The great disadvantage is the invariable production of pain;but this can usually be avoided by strict antisepsis and great care in their administration.They sometimes inspire the patient with fear,but this should be no obstacle to their employment. They are contraindicated in diabetes,Bright's disease, and marked visceral lesions. A gross error,and one that had been widely circulated,is that mercurial injections are a rapid cure for syphilis.On no account should this idea be encouraged.It should aos be remembered that mercurial injection has not superseded other methods,but is merely a most useful adjuvant treatment.

The preparations of mercury used for intramuscular injection are the soluble salts and the insoluble ones. The chief soluble salts of mercury are(with doses parenthetically displayed):Benzoate(gr.1/3),biniodide

(gr.1/3),alaninate(gr.1/6),asparginate(gr.1/6 - 2/3), oxycyanide(gr.1/3),perchloride(gr.1/6 - 1/3), neutral salicylate(gr.1/3),basic salicylate(gr.1/3),sozoiodolate (gr.1/3),succinimide(gr.1/3),hermophenyl(gr.1/3),mercuric-salicylarsenate(gr.1/6),diodoparaphenolsulphonate (gr.1/3).The oxycyanide contains the greatest percentage of mercury(85),then the perchloride(73),next the succinimide(50 - 55),and lastly the alanimate(53);while the sozoiodolate contains the least(35).The latter and the biniodide contain iodine.Most large druggists keep these solutions in stock ready for injection.In the case of women the doses must be weakened,for the reason already given.Sublimate is sometimes prescribed in the form of sal alembroth,which is a double salt of perchloride of mercury and an alkali metal;Bloxam popularised its use at the London Lock Hospital;it is apt to undergo decomposition,so it should be freshly made and never kept in stock for longer than about thirty days.Corrosive sublimate(gr.x.),ammonium chloride(gr.v.),and distilled water(m.ccc.);and Hydrargyre sublimate(gr.x.),sodium chloride(gr.xx.),and distilled water(m.ccc.)are solutions that contain a third of a grain of the salt in every ten minims.It is advisable to use cocaine before making the injection;and the succinimide one usually requires its addition;thus - Mercuric succinimide, gr.x.;cocaine nitrate, gr.v.,distilled water, m.ccc. Solubility and amount of iodine present are increased by the addition of iodine to the sozoiodolate;thus - Mercury sozoiodolate, gr. x., sodium iodide, gr.xx.,distilled water, m.ccc. An advantage attached to the exhibition of mercuric salicylarsenate is that little pain is produced by its injection;another one is that the arsenic acts as a powerful tonic.

The insoluble salts are also numerous;the principal ones are: Calomel(gr.i.-ii.),phenate(gr.iss.),protoiodide(gr.ii.),salicylate(gr.ii.)thymolacetate(gr.ii.), and gray oil.The first-mentioned contains 84 per cent. of mercury,the next 51.the third,61;the fourth,59,and the thymolacetate 56.

There are various forms of the so-called gray oil. One of the best known is that of Lang,which is an intimate mixture of fat,oil,and metallic mercury.It contains,as now made,fifty per cent.of the metal,though in certain cases a thirty or twenty per cent.is employed.It is advisable to first prepare a basis ointment,consisting of lanoline and mercury,and after this,by admixture with oil,to prepare the oleum cinereum for injection purposes. The process of manufacture is rather complicated,and need not here be described.Its specific gravity is 1.5, so that one and a half grains of mercury are contained in two minims. Lafay's gray oil contains forty per cent. of mercury,and is made up of forty parts of the metal, twelve of sterilised anhydrous lanoline,thirteen of sterilised white paraffin,and thirty-five of sterilised oil of vaseline.Its specific gravity is 1.4,so that one and two fifths grains of mercury are contained in two minims. Lambkin's cream contains ten per cent of mercury,and is made up of one part of the metal,four parts of anhydrous lanoline,and sufficient liquid paraffin,carbolised to the extent of two per cent.,to make ten parts.It is solid at ordinary temperatures,and enough for each injection should be warmed in the water-bath.The two oils first mentioned require a special

syringe,so that the last preparation is now generally preferred.

Calomel may be freshly prepared as an emulsion containing two and a half,five,or ten per cent. of the drug.The emulsion is made by suspending the calomel in liquid paraffin or oil.The five per cent.solution is most used,and from ten to twenty minims are injected for a dose.In the event of larger doses being indicated, a ten per cent.solution may be employed.The salicylate if used as a five or ten per cent.emulsion in liquid paraffin,a half or a grain being injected for a dose.The gray oil is a very popular insoluble injection,and is used in the forms described.

Great attention to details is required in making these intramuscular injections.All ingredients must be sterilised,and the instruments must be carefully aseptisised.The site of the operation must be carefully prepared and rendered germ-free.The more care taken in these respects the better will be the results.Carelessness has done much to bring the method into discredit in certain quarters.A glass syringe should be used. The soluble salts may be given subcutaneously,but this method is painful,and intramuscular injections are now preferred.Abscesses and gangrene usually arise when the insoluble salts are given other than by intramuscular injection.After the operation the wound should be closed with collodion.The needle should first be inserted into the selected muscle,and withdrawn.If no bleeding occurs,a vein has not been punctured,and embolism will not occur.Each patient should have his own special needle.It is of the utmost importance that the site of injection should be properly selected.Unless the patient is confined to bed,the buttock is the usual place; bed-ridden patients should be injected in the deltoid or scapular regions;again,some patients prefer the back to the buttocks.When the buttock is selected,it is very necessary to avoid causing injury to the sciatic nerve, and also to select a part which will not interfere with the patient's comfort when sitting.The outer and middle thirds of the gluteal region,one inch above the great trochanter,satisfy these conditions.The part to be avoided is that formed by a line beginning an inch outside the posterior superior iliac spine,and ending at the point of intersection of the gluteal fold with the posterior mesial line of the thigh.The right and left sides of the body should be injected on alternate occasions.The smallest sufficient dose should be secured and adhered to.

The soluble preparations of mercury may be injected every day or every other day.Less often than a bi-weekly injection is insufficient.The injections are made until the gums are touched,and then used less frequently.For symptomatic treatment,daily injections for three weeks are usually sufficient.Soluble injections are commonly used for symptomatic,but rarely for routine therapy.In the administration of the insoluble salts by injectionthere is a choice of two methods.One way is to give an injection every two weeks for a year,or until there have been no symptoms for six months;then every three weeks for six months;then six months of rest;and, finally,one every month for six months.Relapses call for one injection every two weeks for three months after their effects are no longer seen.The other method

is to give an injection weekly until all active symptoms have disappeared,usually from six to eight weeks;then one every two weeks for three months,followed by two months of rest;and,finally,three months' courses of fortnightly injections,with intermissions for the rest of the course.

Insoluble injections are more often used for the treatment of syphilis than the soluble,though the choice is entirely a matter of individual preference.The effects of the insoluble salts are better understood and permanent,and their composition has been greatly improved. Gray oil is very popular,and is perhaps the most suitable of all for routine administration.It is efficient and not too painful.Calomel is very painful,and few patients can tolerate more than six successive injections. It is,however,the most powerful method of exhibiting mercury,and should be reserved for urgent cases only where a rapid effect is demanded,such as in cerebral or spinal syphilis.Insoluble preparations are slow to act, so that a soluble injection may sometimes constitute a useful preliminary.Corrosive sublimate is the best of the soluble salts of mercury,although the biniodide is the most efficient and the benzoate the least painful. Basic salicylate is very useful in the early stages,and the sozoiodolate in the later.The soluble salts are quickly eliminated as theyare absorbed.But they require the daily visiting of the patient,give rise to cumulative pain,and are relatively inefficient.They have also the disadvantages of causing abscesses and gangrene when great care is not exercised,embolism may occur,as also toxic symptoms and induration.Embolism is rare, occurring in only 0.1 per cent.of cases,but is nonetheless an existing danger to be thought of.The pain varies greatly,lasts from two to ten days,and usually begins about the second or third day.The danger of producing toxic phenomena is ever present,and is usually indicated by the occurrence of diarrhoea.Induration is not now so common as formerly;forthwith in its appearance the injections should be abandoned;and it sometimes lasts for months and may call for excision of the part.

Bacelli was the first to introduce the method of treating syphilis by means of intranvenous injections. The procedure has not yet,however,gained what may be termed a popularity.Some writers condemn them entirely, and others recommend them only in certain cases.Syphilitic ocular affections are so destructive,and so rapidly destructive,that the most speedy method of getting the patient under the influence of mercury must be employed. This indication is met by intravenous injections,which may also be used in such cases as intramuscular injections give rise to bedsores in bed-ridden patients.Paralytics,for instance,may be treated thus.The oxycyanide, the perchloride,and the biniodide are the preparations mostly employed.Bacelli recommends for daily injection in fifteen-minim doses a solution composed of corrosive sublimate - gr.i., sodium chloride - gr. iii.,and distilled water - ʒii. The oxycyanide can be used as a 0.1 per cent.solution,and the biniodide as 0.1, 0.2,or 0.3 per cent.solutions. The injections are made every day until the gums are touched,then every second or third day according to the condition of the mouth.Prior to use,the injection should be heated to 90.F.,in order that local thrombosis may not occur.The basilic or

median cephalic vein is usually selected for the injection, the operation being conducted under strict antiseptic precautions and made slowly in the direction of the blood-current. Chopping (Lancet, Feb. 18, 1899) has treated eighty-four cases of syphilis by intravenous injection of cyanide of mercury. The arm is rendered aseptic by washing with a solution of carbolic acid; a rubber tourniquet is applied to the upper part of the arm to make the vein stand out. A fine needle of a hypodermic syringe, containing twenty minims of a one-per cent. solution, is then introduced into the chosen vein in the direction of the blood-stream. The tourniquet being removed, the fluid is injected into the vein, the needle is withdrawn, and an antiseptic swab applied to the point of puncture for a few minutes. He repeats this injection every morning, unless there be some contraindication. In the eighty-four cases treated in this manner, the complications encountered were very slight and rapidly disappeared. All the cases with but one exception showed a marked and very rapid improvement. The average stay in the hospital per case was about twenty-three days. In the worst cases other adjuvants, such as cod-liver oil and iron and a properly-regulated diet, were resorted to. In all cases special attention was paid to the general health. In the tertiary and some of the rupial cases the iodides of sodium and ammonium were used. In all cases special attention was paid to the general health of the patient. On discharge from the wards all were advised to undergo a further and prolonged course of the ordinary methods of mercurial medication. Lindstroem (Presse Méd., May 18, 1898) says that the direct introduction of mercury into the blood exercises a most useful influence, and that improvement takes place almost immediately; small doses should be given at first and gradually increased. If, however, too large doses are used, or it is continued too long a time, mercurial anaemia may develop; careful antiseptic precautions should be exercised. Tait (Jour. Amer. Med. Assoc., June 17, 1899) thinks that the intravenous method of treating syphilis with mercury should be regarded as an exceptional measure, of infinite value when other recognised methods have failed: in glossitis and gangrenous cases, and in those demanding rapid action or early mercurialisation for malignant tendency; it should be reserved for lesions of exceptional severity when other methods of medication have failed; in the differential diagnosis of certain neoplasms in suspected tertiary syphilis, or in the presence of the numerous pseudo-phenomena or grave symptoms of obscure origin, intravenous injections of mercury constitute the only thorough test, of infinitely greater value than the iodides. According to Lichatchew (Vratch, xxii., 1901, No. 44), injections of perchloride of mercury, 1 : 1000 to 1: 5000, into a vein are safe; the injections are contraindicated in individuals with sclerotic vessels; condylomatous syphilitic manifestations readily yield to this method, and their disappearance is more prompt than after the drug is injected under the skin; no toxic effects have been noticed, either in the mouth or the intestines; relapses are more frequent than after the hypodermic method; he does not recommend the intravenous method for general use, but holds that it is indicated in cases of intolerance towards other methods.

A very useful and convenient way of treating

syphilis is by the well-known method of inunction.Some have gone the length of affirming that it is the best of all therapeutic plans in this disease;but neither theoretical observation nor practical experience have justified this assertion.Cases in which inunctions are ineffectual and in which injections alone produce results have often occurred in my practice,and in that of others.It is probable that the integument of some patients is less suited to the method than that of others.The massage employed is an important part of the treatment, and residence at a spa will admit of this being carried out to perfection by trained attendants.There are numerous advantages contingent to the method,one of which is that of great convenience,leaving as it does the stomach unaffected and free for the ingestion of tonics or other medicaments.It is efficaceous,even more so than oral administration,and also painless.The alimentary tract is less liable to be irritated by it than when the drug is orally administered,and specific lesions of the auditory apparatus respond readily to its employment.It is well suited to debilitated subjects,for those confined to bed,for those who cannot tolerate internal ingestion, and when the patient is taking a rest from the latter method.Yet the method is not easy as one would suppose; for the patient must be seen two or three times a week;the dose of the ointment requires careful attention,and the effect of the drug must be carefully noted.The weight of the patient should be taken every week,and toxic symptoms must be looked for and the patient told exactly what to expect. Again there are certain disadvantages contigent to the method,such as certain skin diseases - e.g.,extensive ulcerations,painfully inflamed nddes, severe ichthyosis,pityriasis rubra pilaris,and similar dermatoes producing profound changes:psoriais is always unfavourably influenced by this form of treatment.Certain cutaneous troubles which complicate syphilis,but which are curable,such as erysipelas,erythema,eczema,or scabies,should first be cured before inunction is practised.The treatment may have to be suspended by the development of mercurial eczema from its use,or perhaps folliculitis.Milder eruptions frequently disappear and do not prevent the continuance of the treatment;but should they become more intense,extending to larger areas of the skin,there is nothing left but to abandon the treatment in this way.Occasionally an attenpt made later will succeed after the eczema has run its course, the skin having now a tolerance for the process.Should the second attempt,however,react with an eruption,the treatment must be definitely given up.In exceptional instances the use of the blue ointment is forbidden by the appearance of an erythema,which occasionally presents a toxic character.The site of the application becomes of a vivid-red colour and shows more or less inflammatory infiltration,and in addition to this there is an increased desquamation,or the exudation is increased to such an extent that vesicles and even large blebs and pustules are raised,or punctiform haemorrhages may sometimes be observed in the skin.Itching and burning sensations are not always markedly present;restlessness and a general discomfort are more often experienced.Occasionally the erythema extends over the whole body,and its eruption is accompanied by slight fever. After a few days the swelling decreases,the vesicles

and blisters dry up,the skin becomes paler and begins to wrinkle,and in severe cases a broadly lamellated desquamation ends the process.The objectionable character of the process is also sometimes urged as an objection. many patients refuse to be treated by it on account of the uncleanliness of the method,and in such cases something else must be done.Warm climates are unsuitable for inunction.The patient may grumble over the general tediousness of the process.But the general indications for the method are numerous.It may,for instance,be used in children,adults,and the aged;and the action on the syphilitic process is,as a rule,excellent and permanent.The effect may be increased or diminished according to the size of the dose.The permanency of the result is probably based on the fact that mercury taken into the body in this manner is only slowly eliminated.Paschkis and others have shown that traces of mercury can be found in the body for years.

The blue ointment or unguentum cinereum - well known to mariners as "blue butter" - may be employed.It must be used pure or diluted with lanoline.From half to a drachm is used at a time.Unguentum cinereum is composed of equal parts of mercury and lanoline,with half a part of olive oil,and is used in the same quantities as the blue ointment.A small quantity of each is used at first, the amount varying with the robustness and sex of the patient,and the dose is gradually increased.The treatment must be stopped when salivation occurs,and the dose diminished when the gums are touched.It is a good idea to have each dose of the ointment put up in waxed paper separately,so that the patient knows the exact amount to use.Both the above-mentioned preparations are thoroughly reliable and efficient.The success of the treatment depends on courses with intermissions.The inunction should be carried out daily for three or four weeks,and a rest of one or two weeks should follow.This should be continued for eighteen months,and for the next eighteen months the inunction should be less frequent, say,two or three times a week.During the third year it is advantageous to give potassium iodide whether there are symptoms or not.The occurrence of relapses will call for a renewal of the treatment,and the continuance of the same for three months after they have vanished.The patient should take a warm bath before commencing the inunction,which is best performed in the evening for the securement of a more even temperature favourable to the method,much sweating not being desirable.Then the part chosen should be rubbed with alcohol and turpentine. The ointment is next rubbed in gently,but thoroughly, for fifteen minutes.If an attendant does the rubbing, another bath should be taken immediatelyafter,and the body should be massaged.If the patient rubs himself,he should wear the same clothes next his skin day and night,and have a bath in the morning.The essential point of the treatment is that theointment should be well rubbed into the skin.A different part of the body is chosen for the rubbing every night.The left side of the chest, the abdomen,the inner aspect of the left thigh,the outer side of the left thigh,the inner side of the left arm, the outer side of the latter,the back,and the corresponding parts of the other side of the body may be used in turns.One may,of course,at times depart from this schedule,according to the seat and distribution of the

syphilitic processes,in order that diseased portions may be more freely anointed than those which are less affected or in a sound condition.The treatment will be more perfectly performed if the ointment is rubbed with even pressure into the parts with the ball of the thumb in long elliptical figures.The attendant who has charge of the rubbing should,as a matter of precaution,wear gloves of leather or rubber.In place of the hand or ball of the thumb,we may substitute an inunctor made of hard-wood in the form of a mushroom with a perfectly smooth surface;the handle is held in the fist and the ointment rubbed in with the leather-shod convex top.Patients who are strong enough may practise the method themselves.The amount of ointment required should first be smeared on the balls of both thumbs,and then the left arm is rubbed by the right hand and the right arm by the left hand according to instructions.Inunctions on the back must necessarily be made by a second person.In greatly debilitated persons inunctions are not well borne,and very often cannot be made.

Taylor says that in syphilitic diseases of the nervous system the patient must be brought under the action of mercury as soon as possible;and,according to him(Clin.Jour.,May 3,1899),this is best done by inunction;at the same time he gives fairly large doses of iodide of potassium(gr.lx.,t.d.s.);the main point is to get the patient mercurialised as soon as possible.Lapowski(New York Med.Jour.,May 6,1899)holds that inunctions are useful in all stages,and that this method is the best of all;the best time for the treatment is the hour of retiring,in a room at an even temperature;the early treatment - that is,prior to the secondary eruption - is of no value;the ideal end of treatment is to stop whenever the disease is cured;the cases of reinfection frequently reported are probably no cases of reinfection, but the remanifestation of the old condition,or due to failure in absorption;the chronic intermittent method of treatment has no advantages over the symptomatic procedure. Campbell(Hot Springs Med.Jour.,1899,Pt.15) gives all his inuction patients a hot bath,and then sponges him with a two per cent.solution of carbolic acid. He then divides the body into the following eleven subdivisions,namely:One and two - the arms,palms,and axillae; three and four - the legs and soles; five,the neck and head;six and seven - the breast and abdomen; eight and nine - the thighs,with the groin and Scarpa's triangle; ten and eleven - the back from the seventh cervical vertebra to the lower part of the gluteal region. One or two of the parts are selected for friction,and from forty to sixty grains of freshly-prepared and well-triturated blue ointment are used for each inunction. The makes the attendant anoint his hands with a simple cereate to prevent absorption of the metal.If the patient's condition and physique are such as will permit, he takes two or possibly three Turkish baths a week. From fifty to one hundred inunctions are given with proper intermissions,and then they are stopped for a shorter or longer interval,as indications and conditions require.In women taking this treatment tonics are coincidently prescribed.

Sections of the skin treated by mercurial ointment show under the microscope the presence of particles of

of mercury in the hair follicles and ducts of the sebaceous and sweat glands.It would seem,then,that the metal is mechanically forced into the pores of the skin,perhaps even more deeply,and there experiences the chemical changes necessary for absorption.It has,however,been determined by clinical observation and repeated researches in this direction that the mercury contained in the ointment becomes vaporised,and is then undoubtedly absorbed in the form of gas,and that to such a degree that occasionally the nurses and even the friends of the patient are attacked by more or less distinct symptoms of mercurial poisoning.In certain hospital experiences the drug has been detected in the urine of occupants of the same ward who were not directly being treated by mercury, but who,being syphilitic,derived great benefit from this strange mode of administration.

In view of this,Welander recommends simple smearing with the blue ointment as a method of treatment for syphilis,which,he says,is as simple as it is effective. His opinion has been confirmed by numerous observers. From a drachm to a drachm and a half of the ointment is spread by means of a spatula,or the handle of a spoon, over the cutaneous region on which otherwise inunctions are made;a muslin or gauze bandage is then loosely applied or the part is bound up in cloth,and the patient is kept in bed,lightly covered,for from ten to fourteen hours.He is then placed in a bath,or the skin at least is washed with soap and water.On the following day this is repeated on another portion of the skin,and the same routine is observed as in the case of inunction.These applications are bestmade in the evening when the patient is about to retire to bed.A considerable amount of the mercury,out author thinks,is absorbed in this way,in all probability through the skin and respiratory organs.The smearing may also be combined with the rubbings,so that about a half of the ointment is rubbed into the skin and the other is merely smeared over the same portion.The rest of the treatment is as above outlined.There are numerous indications for this mode of treatment.Weakly and debilitated persons who have been much distressed by one inunction are very well capable of tolerating the simple applications;ulcerated and tender skin nodes,as well as ichthyosis,pityriasis rubra pilaris,and other dermatoses,which contraindicate mercurial rubbings,do well under this plan,though there is some doubt about this combined method being as permanent in effect as plain inuction;for while in the latter particles of the metal penetrate the skin and are retained in the tissues for a some time,this does not occur when the ointment is simply spread on the skin.

Mercurial soap may be used if preferred,and is similar in action to the combined method just described.

Unna and others have spoken highly of the efficacy of mercurial plaster.It is particularly useful in the case of children.The method consists in the application of emplastrum hydrargyri of the width of about three inches over the skin of the upper extremities in the direction of their long axis(cross strips constrict the part),and over them loosely to apply a gauze bandage. At the end of from four to eight days,the plaster is removed and the arm is bathed and dusted with powder.Then the second arm is plastered,and a further period of from four to eight days later one lower extremity,following

this the other leg,and then the trunk.Should the treatment require continuing,the arm is again commenced with and the same order of application observed as just described.It is very necessary to aseptisise the skin before the application of a fresh plaster.Between the plasterings an interval of from one to four days is allowed, according as a severe or moderate effect is desired.The skin is not irritated by a properly constructed plaster; even when itching occurs in the first few days,it usually takes its departure very soon and does not call for a suspension of the treatment.It is curious to observe that the absorption of mercury appears to go on even when the plaster is not renewed for a considerable time,although the traces of mercury cannot be found so distinctly or for so long a time as after inunctions.The plaster treatment constitutes a mild mercurial course with a good and equable effect,and is therefore especially applicable in the treatment of syphilis in children as well as in adults,particularly when local absorption is desired in conjunction with the constitutional effect. The presence of extensive ulceration is no absolute contraindication to the use of the plaster.If the ulcers are filled with oxide of mercury gauze or corrosive sublimate gauze,and then covered with plaster,the secretion will be absorbed by the former,while there is no interference with the action of the plaster.

For the same indications Quinquand uses a plaster of calomel.Gillet((Jour.des Prat.,Sept.29,1900)has treated many cases of infantile syphilis with it,and says it has many advantages over other methods;the digestive tract,even in the youngest and most delicate child,is not disturbed;the absorption continues constantly,and is not limited by carelessness or forgetfulness of attendants;and the medication can be withdrawn at will.

Some writers speak highly of the use of calomel traumaticin,which consists of guttapercha dissolved in ten per cent.of chloroform and used like collodion,calomel being duly incorporated.The effect is,on the whole, a mild one;but the urine,being found to contain the drug, absorption undoubtedly occurs.It should,when used,be applied to different parts of the body two or three times a week.

Mercury may also be administered by the method of fumigation.It is a painless,clean,and very efficient procedure.The mercury acts very quickly,and the result is more powerful than either oral or inunction administration.It has also the advantages of inunction,but,like this,it is more troublesome than ingestion by the mouth, and is rather prone to produce unexpected salivation.The occurrence of diarrhoea calls for its immediate abandonment.It is a method that has been practically abandoned by present-day practitioners as a routine measure,since it is more troublesome than other methods,is more difficult to apply privately,and is in the majority of cases not attended by better results.The drug commonly employed is calomel,the average dose being twenty grains.The black oxide of mercury may also be used,in doses of about two drachms,but is more irritating than the salt just named.The apparatus consists of an alcohol lamp placed beneath a metallic saucer,which is supported on a tripod.This apparatus is placed beneath a cane-bottomed chair,upon which the patient is seated naked,

and with a blanket pinned tightly around his neck and dropping to the floor, enclosing the body and chair in a sort of tent. Thirty grains of calomel are placed in the metallic dish, the alcohol lamp is lighted, and the blanket is draped around the patient. The lamp is extinguished at the end of twenty minutes, and the patient is allowed to sit for twenty minutes longer in the calomel vapour; he then wraps himself in the same blanket that he has used during the vaporisation, and retires to bed for two hours, or for the night of the procedure is carried out before bedtime. There should be someone present during the fumigations, as the patients now and then faint from the heat of the tent. The method is indicated after others have failed, and particularly in cases of widely diffused small, hard, papular syphilodermata, or when there are present obstinate or precocious ulcerations. In such cases it sometimes gives marvellous results. The method may be used locally for the cure of obstinate plantar or palmar skin efflorescences, the foot or hand being kept in a box of mercury vapour for one or two hours at a time.

Mercurial baths are only seldom used nowadays, though formerly they enjoyed a measure of popularity; other methods are more exact and easier of application. The value of such baths, however, in combating by direct action certain widespread syphilodermata, and particularly in exerting an antiseptic effect upon pustular and ulcerating eruptions, thus minimising the effects of pyogenic infection or altogether preventing the same, is beyond question. These baths are of grear service in papular and pustular syphilides, papular and ulcerating gummata, and moist papules, particularly in cachectic patients who do not well support vigorous treatment by the mouth. Tubercular and gummatous cutaneous affections also do well under it. The partial baths may be employed when the whole body is not involved in the syphilitic lesions. Lesions about the genitals and the rectum may be benefited by a sitz-bath, or in the case of plantar or palmar psoriasis or syphilitic onychia the hands or the feet alone may be put into the water. Corrosive sublimate is the salt usually employed, the strength of this bath being 1 in 20,000. Finger advises that from two drachms to an ounce of the drug should be dissolved in a pint of water and be added to the bath. It should be at a temperature of 70. to 80. F., and this temperature should be maintained by the addition of hot water from time to time, the patient remaining in the tub for about two hours daily, immediately after the bath is completed retiring to bed for an hour, or for the night if the bath be taken at bedtime. Gaertner has devised a method for the active absorption of mercury, in the form of corrosive sublimate by the skin, using electricity; he claims that the dosage of the drug can be accurately regulated in this way. The patient is immersed in a solution of the sublimate, through which a current of electricity is passed for the purpose of occasioning absorption. The method is most elaborate, and it appears to be inferior to other procedures as regards results. They are also very expensive and therefore beyond poorer patients.

Some time ago Audry introduced the method of administering mercury per rectum, his idea being to give two- or three- or four-centigramme suppositories of gray oil and cacoa-butter. Other preparations of mercury

were tried,but their effect was doubtful,so the gray oil was definitely adopted for exhibition in this way. At first two suppositories were used per diem;but,as they caused pain in the rectum,only one was employed in the twenty-four hours.The suppositories each contained three grains of mercury;and this was usually well borne, and with satisfactory results.The symptoms commenced to abate after four days,and the method was considered as efficient as any of those above described.It is certainly practical and also painless,and is to be recommnded in the presence of gastrointestinal derangements and for children.It is not a dirty and repulsive method,and the suppositories can be introduced overnight.Rectal troubles will,of course,contraindicate their employment.Its use is mainly symptomatic,as the treatment cannot be prolonged during the long time necessary for a cure.In some cases proctitis,tenesmus,pain indefaecation,and spasm occur - all of which will call for the abandonment of the measure.

Masks of fine wire,covered with a layer of molleton and inpregnated with mercury in a state of minute division,have been recommended by Kronmeyer(Practitioner, Sept.,1908).Each mask contains two drachms of the metal and is worn by the patient at night.The method is easy of application,and good results are not infrequently secured within a week.The duration of the traatment is thirty days,and during that time the mask requires changing two or three times.It is suitable for occasional special use,is better than inunction,and slightly less effective than intramuscular injections.

A method of comparatively recent introduction is that of the mercurial apron,which is covered with the blue ointment.A piece of gauze or flannel,twenty inches long and sixteen inches wide,which is fastened with tapes about the neck and waist,is spread daily,or every few days,with from one and a quarter to two drachms of the ointment(the gray may also be used).The cloth can be worn on the chest or back.The patient remains from ten to fourteen hours in bed,but wears the cloth also during the day.The ointmentis spread by the patient himself. This method,devised by Welander(Cited by Stern.- Münch.med. Woch.,Feb.7,1899)rests on the old theory of Gerhardt that the inunction cure is nothing else than the inhalation cure.Welander's method had been used by Stern in one hundred and two cases of recent and old syphilis.The time required to obtain results was about that needed in other methods,but the procedure was found to have the advantage of simplicity and cleanliness over the inunction treatment,and of the absence of pain,and of inconvenience over injections.The patients were directed to spread daily for three weeks one and a quarter drachms of the ointment on flannel and gauze,and during the spreading to bend as low as possible over the cloth,and to consume at least ten minutes in the spreading of the drug.During the next three weeks the cloth was spread every other day.

Two other little-used methods consist in wearing a bag containing mercurial ointment,or placing cotton-wool impregnated with the drug on the pillow before retiring to rest.

Ahman(Arch.f.Derm.u.Syph.,April,1899)introduced a preparation which he called mercurol,and tried it on numerous syphilitics.In it the mercury is reduced to

very fine particles,and is free from the objection of aggregating into large masses.The method is based on the fact that mercury easily amalgamates with aluminium or magnesium,from which it can be separated by the addition of water,forming a hydrate.Mercuriol contains from forty to eighty per cent.of metallic mercury in fine amorphous particles.When exposed to warmth,air,and humidity,the aluminium and magnesium are oxidised,and mercury set free.Mercury was found in the urine in all the thirty trial cases.The apparatus used was that of Welander,where the drug is placed in a woolen bag and worn next the skin.One and one-fourth drachms of mercuriol were used daily for the first five or ten days;and the method is,according to our author,better and cleaner than inunction treatment.

IODINE.

The efficacy of iodine preparations in the treatment of syphilis was known even to the early syphilographers. Girtanner used a burnt sponge for veneral ulcers of the throat;and in 1821 Martini(Hufeland's Jour.,Apr., 1833)substituted iodine itself for the sponge,and claimed remarkable success from the procedure.According to him,numerous patients who had syphilitic lesions of the throat,and who had failed to benefit from other methods of treatment then in vogue,astonished him by a strikingly rapid recovery from their ulcerations and the accompanying cachexia.About the same time Biett used iodine in combination with mercury,and in every instance with signal success,particularly as regards obstinate syphilodermata.Three years later,Brus used the tincture of iodine internally,in twenty- to forty-minim doses,and also externally,in the case of buboes.Lugol,in 1831,cured several tertiary cases by iodine preparations alone.The first practitioner to prescribe iodide of potassium in syphilis was a Dublin physician named Wallace;he fixed the dose of the remedy and described minutely the indications for its employment.Mainly by his advocacy the drug became generally popular and received a place in the therapy of the disease from which it has never been ousted by any other medicament.He conducted a series of observations,commencing in 1832,and four years later published the results thereof in the form of lectures (Lancet,March,1836).He treated some one hundred and thirty-nine patients with the drug,of whom six suffered from iritis,six from testicular affections,ten from osseous and articular troubles,ninety-seven from syphilodermata,and twenty with diseases of the mouth and nose and throat;and it would appear that three pregnant syphilitics were also subjected to the same form of medication with the object of successfully protecting the product of conception from syphilitic infection.He used a mixture of his own invention,so arranged that the patient took about thirty grains of the iodide daily. His brilliant results attracted the attention of the profession everywhere,and on all hands the drug was tried - in all cases with most satisfactory effect. Ricord(Bull.Gén.de Thérap.,T.xii.,1837,p.241)noticed that tertiary lesions were more favourably influenced by iodide of potassium than secondary affections. Deep-seated lesions of the skin and mucous membranes,gummy tumours of the cellular tissue,and lesions of the bones seemed to him to yield most readily to the exhibition of

the remedy.This fact,which was accepted by Trousseau, Payan,Gauthier,and many others of note,was taught by Bazin;and in time it was generally admitted.It was further ascertained that,by increasing them gradually,larger doses than those used at first by Wallace could be given with safety.By degrees,from fifteen to sixty and even ninety grains of the drug were given daily;the dose was still further increased,but without any increased ben--efit arising therefrom.But there were not wanting observers who made bitter attacks upon the remedy;but in time its good effects were so generally recognised that even the most sceptical could no longer refuse to place it by the side of mercury in the treatment of the disease.

Iodine itself,it is well known,is obtained from the ashes of sea-weeds and from crude Chilean saltpetre. It occurs in the form of bluish-black scales,gives off a characteristic violet vapour and emits an acrid and disagreeable odour when burned.It was discovered by Curtois in 1812 in sea-salt.It is not found in a pure state in Nature,being combined with potassium or sodium in marine plants,which absorb it from their surroundings.Iodine melts at 107.,but volatalises at 175.C.It gives off fumes or ordinary temperature.It is but slightly soluble in water,that is,one part in about seven thousand;but is very easily dissolved in glycerine and alcohol.It gives a dark-yellow or brown colour to all substances over which it is lightly applied,but wherever starch is present the colour obtained is blue.This property to colour starch blue is so marked that it serves as the basis of various tests that make it possible to detect iodine in about four hundred and fifty thousand times its weight of water.Its detection in urine is greatly facilitated by allowing a portion of the liquid to evaporate;the addition of a few drops of nitric acid serves to insure the liberation of any iodine that may be present in combination with other substances. Jolles)Zeit.f.Anal.Chem.,1891,Bd. xxx.,p.288)tells us that in estimating the iodides in the urine the decomposition of these salts by chlorine may be employed.Two and a half drachms of urine are taken,and an equal quantity of hydrochloric acid and two or three drops of chlorine-water added.A brown colour appears,which is changed to blue by the addition of starch-free water.For quantitative estimation the urine is evaporated and charred and the char burned off.The residue is taken up with water acidulated with nitric acid, and nitrate of silver added to excess.The precipitate consists of the chloride and iodide of silver.It is collected,dried,and weighed,and then subjected to chloridisation as above.The difference in weight,due to the transformation of the iodide into the chloride,is the basis for calculation of the quantity of iodine in the primary precipitate.Gillet(Ann.de la Polyclin.,Oct., 1891)called attention to a source of failure in recognising the presence of iodine in ammoniacal urine.When one adds strong,fuming nitric acid to the urine containing iodine the iodine is freed,and is usually recognised by solution with a purplish colour in chloroform.If,however,the urine contains ammonical compounds,this reaction may be quite different.The iodine reacts upon the ammonia salts,and is formed into nitric iodide and hydriodic acid.This substance is very unstable,and in decomposing forms iodic acid,hydriodic acid,and nitrogen.Thus,one mayentirely failt to get the characteristic chloroform solution.To such a urine caustic potash should be added

to replace the ammonia,in order that this mistake may not occur.

The application of iodine to the unbroken skin gives rise to a yellowish-brown coloration.At first there is a slight irritation;but when the applications are too often repeated,or the preparation is used in too concentrated a form,the skin may undergo active inflammation,which usually subsides,however,when the applications are stopped.Iodine and its preparations,when taken interhally,is eliminated by the kidneys,and tends to irritate them when large doses are ingested.At first the amount of urine is increased;later on it is decreased,and the proportion of urea may also be gradually diminished.It often gives rise to albuminuria,and nephritis has been ascribed to the influence of the iodides;but the evidence that inflammation of the kidneys was not already present before the administration of the remedy has not been made clear in the cases reported.Despite Haig's opinion to the contrary,increase of the products of metabolism,urea, etc.,in the urine,has been noted by many observers;and it is probable that contracted kidney,a condition now known to be present in most cases,in part accounts for his views.See and others have claimed that iodine accumulates in the system,and that its elimination occurs irregularly.Kuss ascribes to this fact the majority of the deleterious symptoms often attending its use.Gerson (Münch.med.Woch.,June 1,1889)describes a case in which iodide of potassium,in addition to the usual symptoms of iodine poisoning,gave rise to a considerable albuminuria, with fatty and granular casts;no iodine was found in the urine,which had a specific gravity of 1026 and a dark colour.Haig(Brit.Med.Jour.,Jan.14,1893)says that arterial tension varies with the uric acid that is circulating in the blood;some twenty drugs,or rather groups of drugs,all diminish the excretion of the uric acid in the urine,and at the same time produce also relaxed arterioles,lowered arterial tension,and diuresis;he classes the iodides with these drugs;and holds that this action of the iodides on the solubility of the urates,and so on the contraction of the arterioles,enables us to explain all their most important effects in physiology and pathology.Kuss says that iodine accelerates the action of the heart in individuals in whom the circulation is quiet. Haig,as shown,connectd the arterial tension with the amount of uric acid circulating in the blood.Most writers recognise the existence of dilatation of the capillaries and smaller blood-vessels;but the reports on this point are extremely contradictory.The concensus of opinion seems to be that the quantity administered has much to do with the question,large doses tending to increase the pressure in the arterial circulation.According to Provost and Binet(Lond.Med.Recorder,Sept.,1890)iodised water and solutions of iodine or iodides do not affect the blood-pressure when injected into the veins;solutions of iodide of potassium,introduced in the same manner,act like potassium and increase it;in larger doses they give rise to blood-pressure fall;iodide of sodium proves less dangerous in this respect,and in large doses gives rise to a temporary increase of pressure,followed by a period of gradual diminution;the effects of the iodides in the treatment of arteriosclerosis may possibly be explained, they say,by their beneficial influence on general nutrition.See(La Méd.Moderne,July 2,1891)finds that iodide

of potassium dilates the vessels somewhat more than does digitaline, and increases very much the peripheral circulation of the arteries which supply nourishment to the heart. Ishumin (Inaug. Diss., 1894, No. 120) has studied the effects of iodide of potassium upon the blood of fifteen patients and four healthy persons before and after taking the drug. According to him, the effects of the medicament in doses of from fifteen to thirty grains a day on non-syphilitic patients and healthy individuals is, during the first two or three days of its administration, to increase the number of young corpuscles and to diminish the number of ovenmature leucocytes in the blood, and at the same time to increase the number of those breaking up; as to the total number of corpuscles per cubic millimetre, the effect of the iodide appeared to be to cause an increase, but a slight one; administered to syphilitic patients, the iodide produced an increase in the number of overmature elements and a decrease of the immature leucocytes and those in course of disintegration. Weber (Post-Grad., Oct., 1898) found that the iodides in relatively small doses, three or four times a day, and continued for many months and even years, had the power to retard, modify, and improve subacute and chronic inflammatory processes in connective tissue of such parenchymatous organs as the kidneys, the liver, the lungs, and particularly so the sclerotic disease of the arteries. It appears that this salutary effect is brought about by direct inhibition of the proliferation of the connective tissue, as well as by subsequent induction of disintegration and fatty metamorphosis of infiltrated corpuscular elements and the removal of the same. It is reasonable to hold that the drug manifests and develops its activity through the lymph channels and spaces of the affected organs by direct action upon the irritating substances, by stimulating the vasomotor nerves and increasing the functional activity of the parts. Our author finally affirms that the favourable influence of the iodides can be clinically demonstrated, and is more decided in arterial sclerosis than in similar affections of parenchymatous organs, and will show itself frequently in syphilitic and other cases. It would appear from all this that the action of the iodides is still a mooted subject; this is due to the obscurities in the pathology of some of the affections concerned, and to the fact that their effects vary not only in different individuals, but in the same person at different times. The iodides do not appear to exhibit external action; they do not irritate the skin, and are absorbed therefrom only in inconsiderable amounts. Doubkat (Marshall's Syphilology & Venereal Diseases) says that the iodides act by stimulating the lymphoid tissue, the process of disassimilation, and by an accessory action on the respiration and circulation; they act by stimulating the means of defence, by provoking leucocytosis, and by bactericidal means. Mucous membranes rapidly absorb the iodides; they are quickly taken up by the stomach and intestines, and appear in the secretions within a few minutes. The greater part is excreted in the urine; but some of the iodide escapes by the salivary glands, and has been found also in the tears and milk and nasal secretion. The whole process of elimination is very rapid, and no iodine reaction is obtained from any of the secretions a week after the treatment has been abandoned.

In certain cases the exhibition of iodine gives rise to well-known toxic effects;to these the term iodism has been applied.These symptoms may appear after a few doses have been taken in individuals who possess a distinct susceptibility to the drug;but in the majority it is not until the dose administered has become quite great.In some persons small doses are more likely to produce iodism than large ones.The phenomena in question consist of coryza and profuse discharge from the mucous membrane of the upper respiratory tract,ptyalism,and an acne-like eruption on or near the shoulder-blades.In certain individuals the active manifestations are more grave,sickness,diarrhoea,and marked frontal headache being complained of.The skin eruption may assume many phases,from a simple acne to dermatitis to eruptions simulating those of eczema,purpura,chickenpox,smallpox, etc.Rohmann and Malachowski(Therap.Monats.,July,1889) hold that,in order that iodism may occur,nitrites must circulate in the blood,and that the reaction on the mucous membrane must not be alkaline.On this theory they base three indications for treatment:first,to attempt to combine free iodine again;second,to remove the nitrous acid at the moment of its liberation from the nitrites;and,third,to prevent the formation of free nitrous acid.No way of accomplishing this purpose could be found. Nitrous acid is destroyed by sulphanilic acid,with the formation of,according to Ehrlich,of diazobenzolsulphonitrate.One and a half drachms of sulphanilic acid and three-quarters to one drachm of sodium carbonate in five fluid ounces were tried immediately after the appearance of iodism;and with the happiest results in a number of cases,thus supporting Ehrlich's views.Two and a half to three drachms of sodium bicarbonate were given in twenty-four hours in two doses.It was found that when potassium iodide and bicarbonate of soda were given simultaneously no symptoms of iodism appeared,but iodism promptly manifested itself on the withdrawal of the soda. In acute iodism in syphilis the headache may reach an alarming intensity;vomiting,vertigo,symptoms of cerebral compression,delirium,staggering gait,somnolence,and coma may supervene.Neuralgias of the cerebral nerves not infrequently occur;these symptoms are probably due to an increased cerebral circulation in vessels which have undergone specific alterations.One of Finger's cases (Gaz.Lekarska,1891,No.24)showed alarming depression of the heart's action;and he thinks that the best method of obviating toxic phenomena is to give the iodide in milk,with or without the addition of belladonna or bromide of potassium.Montgomery(Med.News,Dec.29,1894) tells of a man who took sixteen grains of potassium iodide daily for sixteen days.Copious watery diarrhoea set in as soon as the drug was commenced,though the patient suffered previously from habitual slight constipation,and the diarrhoea persisted during the administration of the remedy,ceasing only when it was discontinued. The patient was much reduced in weight,but quickly put on flesh again when the iodide was stopped.The drug was pure,and contained neither iodates not free iodine.Calomenopoulo(Jour.des Prat.,1896,No.18,p.288)reports the case of an syphilitic who was absolutely intolerant of iodide of potassium,even when given in small doses;when ninety grains of sodium chlorate were given each day it was possible to administer forty-five grains of the

iodide without unpleasant effects,and during as long a period as forty days at a time.In all cases of iodine medication it is very necessary to keep a close watch on the condition of the respiratory passages,particularly on the glottis where oedema may occur in syphilitic cases.This danger may be decreased by allowing the patient to partake freely of water during the iodine course. Groenouw(Therap.Monats.,Mar.,1890)has collected a series of ninecases from the literature which show that in rare instances the internal use of iodide of potassium may suddenly produce oedema of the glottis,and to such an intense degree that tracheotomy may have to be performed. In certain instances the odema is so severe as to produce death,although in others it may disappear as rapidly as it occurs.It was shown that the unfortunate result may occur soon after the ingestion of the drug,and even after small doses.Four cases presented the oedema on the first day,one under a dose of fifteen grains,two under seven and a half grains,and the fourth under as small a dose as three grains.It was observed,where oedema occurred,that all other symptoms of iodism were absent,and, further,that age and sex had no influence;that it appeared in otherwise perfectly healthy persons,and that after the disappearance of the oedema persistence in the use of the drug produced no unfavourable after-effects;so that iodism is not a permanent condition.Oedema of the glottis,fatal in a few minutes if not promptly relieved, may supervene on the early administration of the drug; and,the longer the iodide is used,the less is the danger of this accident.Heymann(Jour.of Laryngol.,Feb.,1892) mentions a case in which,some days after the omission of the iodide of potassium,which had been given for the treatment of syphilis,there occurred laryngeal stridor and oedema;the affection disappeared eight days later. Thelong-continued exhibition of iodine or its preparations had been known to cause atrophy of the breasts and testicles.Mental ailments,insomnia,hypochondriasis,and hysteria have also been noted.Peripheral nervous disorders,such as neuralgia,neuritis,and the like,have now and then been seen.The neuralgia is sufficiently severe at times as to require the abandonment of the remedy.Küss says that the menstrual flow may assume an haemorrhagic form.Rapid emaciation may also occur.Children are less likely to show iodism than adults.The chances of the accident occurring are lessened when the iodide is taken in a well-diluted condition.According to Jatzuta(Inaug. Diss.,1890,No.12)the absorptive power of iodide of potassium and sodium salicylate diminishes as the age of the patient advances,and that is probably due to the different condition of the vascular system existing at different ages.Comby(La Méd.Mod.,July 10,1895)lays great stress on the fact that iodism is of exceptional occurrence in children;and he is quite convinced that the younger the patient,less less often will the accident be encountered.

The treatment of iodism is the withdrawal of the drug,which soon leads to the disappearance of the symptoms.The cachexia,however,takes longer than the symptoms to depart.Probably the best remedy for the condition is liquor arsenicalis,which in no way interferes with the action of the iodine preparations.It is perhaps the best preventive of iodism we possess.From two to four drops during meals in water,the iodides being administered

after meals in considerable water,most satisfactorily meet this indication.The carbonate of ammonia,the bromides,and belladonna have been extolled by some writers; but these agents are liable to give rise to unpleasant symptoms when given during a prolonged period,the bromides being particularly objectionable in this respect. In the majority of cases the iodide need not be discontinued.By reducing the dose the untoward effects may be sufficiently mitigated.When the iodides are completely withdrawn,they sometimes cause a renewal of the iodism even more severe than the first manifestation thereof. Briquet(La Sem.Méd.,1896,No.18,p.137)recommends for the treatment of iodism the use of from one to two grains of the extract of belladonna,the occurrence of the nasopharyngeal symptoms being prevented thereby.He gives sodium bicarbonate in doses of from one and a half to three drachms to benefit the general manifestations of the iodic toxicity;and he thinks that from forty to sixty grains of sulphanilic acid daily will fix the nitrous acid,which,remaining in a free state,would decompose the iodide.In addition,a diet poor in nitrates, as milk and bread and meats,should be insisted upon.For the eruptions he considers antisepsis of the skin of great importance,and that 1 : 25,000 baths and lotions of permanganate of lime are useful.The best method, however,he finds in prevention.He always commences with a small dose of seven grains,and gradually increases this;together with the drug milk and even diuretics in large quantities are prescribed.Some of his cases required tracheotomy;haemorrhage he treats with ergotine,and salivation by potassium chlorate.Capitain(La Méd.Mod., June 8,1898)holds that iodism is entirely due to the elimination of iodine by the various mucosae of the body; the decomposition of the iodine salt which precedes this elimination is due to the presence of nitrites in the blood;by using naphthionic acid this decomposition is prevented.In some of Somers's cases (Med.News,Sept.29, 1900)small doses of iodine produced iodism,while in others large doses were taken without effect;he determines the dosage by the effect produced upon the diseased process;many patients appear to have a maximum iodine point,and,if more than this is given,iodism occurs;the simultaneous exhibition of arsenic and belladonna often prevents the occurrence of iodism.Montgomery(Med.Age, Oct.25,1900)thinks that belladonna is the best drug to relieve the coryzo-like effects of potassium iodide when five drops of the tincture are given with each dose of the iodide.Bretonneau(Ann.de Thér.Dermat.et de Syph., T.iii.,1902,No.7)recommends for the prevention of iodism the employment of alkaline benzoates,preferably benzoate of ammonium.It is best given in cachets containing about three or four grains,of which four to eight may be given per diem.He suggests that the antiseptic action of the salt and its eliminative action may be responsible for its remedial effect.

The iodides are extensively used in the treatment of syphilis,though their germicidal effects are inferior to those of mercury:hence the aphorism,mercury cures,iodine relieves,which is not without scientific foundation.This may explain the great value of mercury in the earlier stages,and the comparative inefficinecy

of iodine during that period.Although this seems to be a well-established fact,there is some diversity of opinion about it,based upon the viewswhich regard iodine either as a direct specific or as a promoter of the eliminative and absorptive processes.If the former view were correct,iodides should be employed oftener and more freely in the secondary stage than is at present the custom.The views of those writers who hold the opposite belief may be summarised by saying that though the action of the iodides is less speedy than mercurial mediation, it is deeper and more durable,and is useful in those accidents that are graver,more destructive,and less liable to heal spontaneously;their sphere of action is, therefore,much greater than that of mercury,and their relative harmlessness is a great advantage.These writers recommend that they should be used in the phagedenic forms of chancre;in the beginning of the secondary period,especially to combat the fever and the cephalalgia; in the erosive and ulcerative syphilides;in all the syphilodermata of transition,the papulo-squamous and papulo-tuberculous;in all tubercular and all malignant syphilides;in all subdermic syphilitic manifestations; and in gummata or gummatous exudates which break down and proceed to ulceration.The opposite school,however, state that,though the iodides,in combination with mercurials or alone,may be used in such milder syphilitic manifestations as erythema and papillary eruptions with general lymphatic involvement,they must never be considered capable of replacing the mercurials;they may be reserved for use in very marked general adenopathy,in scrofulous individuals,in rheumatoid diathesis and headaches,accompanied or not by loss of sleep,in unfavourable hygienic or dietetic conditions,in diseased conditions of the gums and teeth,and in general in all those conditions in which the use of the mercurial preparations is contraindicated by the idiosyncrasy of the patients or the constitutional complications.Finger advises the combined ise of the iodides with the mercurials in the later stage of syphilitic treatment,when,he says,they are superior to mercurial preparations.Neumann,on the other hand,often uses the iodides inthe milder relapses of the secondary stages and in those of the tertiary,reserving the mercurial treatment,in the form of inunctions preferably,for the severer manifestations of both periods;he regards the iodides as particularly useful in periostitis of the joints,muscles,or synovial sheaths of tendons,and in the tertiary lesions of the ocular system and the viscera.when inunction treatment may simultaneously be employed.It is the general opinion nowadays that the efficacy of the iodides is so trifling in the ordinary cases of secondary syphilis that it is more than counterbalanced by their influence upon the gastrointestinal mucous membrane.As a rule,their therapeutic value increases in direct ratio with the age of syphilis,but even in early syphilis the iodide should be added to the mercurial treatment whenever extensive and dense exudation has occurred,whether inthe deeper layers of the skin, in the underlying connective tissue,in the periosteum or bone,or in the internal organs.The dose of the iodides may be determined by the effect upon the symptoms. True,it may lead to the administration of enormous doses,but if the diagnosis be assured the evil effects of the drug are not to be compared in gravity with those

of the disease.Used in this way,one will often be pleased to find the iodides finally causing the disappearance of obstinate osteocopic pains or violent headaches,the resolution of large and threatening gummatous swellings, the subsidence of periosteal nodes,the cicatrisation of enormous ulcers,the return of power to paretic or paralysed muscles,the cessation of epileptiform convulsions, and even the reestablishment of the mental faculties after they have to all appearances been permanently and hopelessly impaired.The results are sometimes striking indeed.Large and increasing doses may also be employed, sometimes with the result of promptly revealing the character of the lesion requiring treatment,in doubtful cases.It must be borne in mind,however,that other obscure conditionsthan those resulting from syphilis may be benefited by full doses of the iodides,and a faulty diagnosis and prognosis may be the outcome of a too implicit reliance on the so-called therapeutic test.Still more dangerous would be the acceptance of the rule formulated by Jullien and Wood.The former says that "the existence of syphilis contributes powerfully towards producing tolerance of the iodides.Experience proves,in fact,that in persons free from this poison the toxic phenomena of iodism are much more to be dreaded.In the same manner an antidote may be dangerous,or even fatal,when the organism is not under the influence of the poison which it is intended to combat."The latter holds that in"all cases of doubtful diagnosis the so-called therapeutic test should be employed;and if sixty grains of potassium iodide per day fail to produce iodism,for all practical purposes the person may be considered to be a syphilitic." These opinions,if well founded,would convey and important practical lesson of the greatest value in the diagnosis of obscure conditions suspected to be syphilitic. But they may be seriously misleading if unfounded. The general verdict of the profession is that no such diagnostic rule can be formulated. The whole question of the iodine therapy of syphilis may be summarised by stating that the drug is curative and second only to mercury;in the form of the iodides it is invaluable, more particularly in the later stages of the disease. The iodides,of which the potassium salt is the type, act in two ways in the cure of syphilisnamely,first,by their own intrinsic power of producing fatty degeneration and elimination of morbid products,especially toxins, and,secondly,by liberating,exciting to renewed activity, and eliminating the mercury that is stored up in the tissues,thus assisting its action.It is evident that the first of these effects is the most important,for the iodides have a most powerful effect in resolving the products of inflammatory changes or adventitious deposits, irrespective of their cause.This,in the face of the argument that iodine can cure syphilis only by liberating mercury from the tissues,and that it is the mercury,and not the iodides,that produces the curative effects.That this is incorrect is shown by the beneficial effects of the iodides in late syphilis when mercury has never been administered at all.In the opinion of some the exhibition of the iodides should be commenced as soon as the case is diagnosed.The duration of the initial lesion is thereby shortened,and secondary symptoms moderated,if not prevented.Hideous after-lesion may also be thus avoided.

There are quite a number of preparations of iodine which may be used in the treatment of syphilis.Of these potassium is,as already stated,the type,and is perhaps more often prescribed than any other.It is a white and colourless crystalline substance,slightly bitter and saline in taste,and soluble in both water and alcohol; its dose if from five to thirty grains.It is the strongest of the iodides,more poisonous than the sodium salt, and now then it is used in heroic doses to meet special indications.It is not suitable for hypodermic administration,and is usually given by the mouth or by the rectum.Free dilutation is of prime importance in avoiding symptoms of gastric irritation or iodism.It us better borne if given immediately before meals,but it may be given during or after a meal to avoid its coming in contact with the mucous membrane of the stomach and so being absorbed too rapidly.But it should not be administered too soon after a meal,since the iodine will form the inert iodide of starchA saturated solution,-say, five drachmsof potassium iodide in an ounce of water,- is the most convenient form in which to administer the drug in ascending doses;in addition to this preparation, the patient may be prescribed compound syrup of sarsparilla,to a tablespoonful of which the required dose of the iodide may be added,the patient immediately afterwards taking one or two glasses of water or milk.The taste of the iodides is rather unpleasant,and may be disguised by syrup of orange,syrup of lemon,coffee,milk, tea,and the aerated waters.Dilute hydrochloric acid is sometimes added to the mixture to promote digestion, and the depressing effect of the drug may be combated by the admixture of ammonium carbonate,tincture of nux momica,or the compound spirits of ammonia.The general condition of the patient may be also enhanced by the compound tincture of cinchona,and also the bitter infusions.Fowler's solution is sometimes added also to obviate the appearance of iodic eruptions.The drug is seldom administered by the rectum,owing to comparative inefficiency;when thus given,the iodide should be dissolved in peptonised milk. Sodium iodide possesses much the same action as the potassium salt;it is less poisonous, and requires twice its weight of water for solution. Cory(Brit.Med.Jour.,May 26,1888)prefers iodide of sodium to that of potassium on the ground that it is less apt to produce nausea,loss of appetite,and emaciation;it also contains more iodine in the proportion of ten to nine. According to certain writers,iodide of rubidium is the only efficient substitute for the potassium salt; while possessing the same advantages as the iodide,it is not as unpleasant to the taste and is better tolerated;the dose and its therapeutical indications are the same.Neisser(Therap.Monats.,1894,No.5)specially insists upon the better tolerance of this form of iodine.Colombini and Pasquini(Jour.des Prat.,Oct.15,1898)have conducted a series of experiments demonstrating to their satisfaction the great value of iodide of rubidium as a substitute for the iodide of potassium;in their syphilitic cases it restored the haemoglobin,increased the number of blood-corpuscles,and increased the weight of the patients.I would also warmly recommend it on the ground that it is less disagreeable than potassium iodide,is less liable to disturb the stomach,and is not

so apt to produce acne or other symptoms of iodism, while it is almost equally potent in causing absorption of syphilitic products and infiltrates. I am of the opinion that lithium iodide is too irritating for general use; it was highly recommended on its first introduction for the large quantity of iodine, more than ninety-five per cent., which it contains. Ammonium iodide occurs as colourless plates, having a bitter taste. It acts like potassium iodide, and is given in well-diluted doses of from three to five grains. Strontium iodide occurs as colourless plates, of a bitter saline taste, and becomes yellow on exposure to the air. It is soluble in hot and cold water, and is given in doses of from five to ten grains. It is similar in action to the potassium salt, but is thought to be less irritating to the intestines. Calcium iodide is very seldom used in syphilis, and need not be further considered. Iron iodide is sometimes a very useful preparation, particularly when syphilitic anaemia is present. It may be given either in pill or as a syrup. The surup of hydriodic acid is too feeble for routine treatment, but may be prescribed for general tonic purposes. The tincture of iodine used to have some vogue in the treatment of syphilis as a substitute for iodide of potassium, but it is now considered too feeble and irriating. Richter (Versam. Deut. Natur. u. Aerzte, Sept., 1901) seemed to have revived its administration in this disease; he gives it in ten- to thirty-minim doses in coffee or red wine three times a day; in twenty-six per cent. of his cases the maximum dose that was well tolerated was fifty drops three times a day. The tincture is really a seven per cent. solution of iodine in alcohol. Most practitioners nowadays refrain from using it internally as it is precipitated by the gastric juices. It should therefore be reserved for topical applications. The so-called colourless tincture contains no iodine and is therefore valueless in this disease. Mercurous iodide, the green or protoiodide, is the mildest and least irritating form of the drug; it has already been referred to. Donovan's solution, which is one of arsenic and mercuric iodide, contains one per cent. each of the arsenic iodide and the mercuric iodide, and may be given in doses of one to eight minims well diluted. Iodoform may be given in pill-form when the iodides are not well tolerated. Iodine itself, in half-grain doses, is now seldom or never used, though formerly of some popularity.

Various substitutes for the iodides have from time to time been devised, each one supposed to have marvellous properties, which in not a few cases were in time utterly disproved. Others are, however, useful when the ordinary iodides are not well tolerated by the patient; but it would seem that they are all more or less inferior to the drugs they are intended to replace under circumstances as ordinarily arising. Some of the more important only require mentioning here. Sajodin is a colourless, tasteless insoluble powder, which is non-poisonous and contains about twenty-five per cent. of iodine. It is usually prescribed in five- to twenty-grain capsules. Iodalbin is of the same class, and is a combination of iodine in the form of an albuminate. It is a dark-brown powder containing twenty-one and a half per cent. of iodine, is given in ten-grain capsules three times a day, followed by a demulcent drink. It is less efficient than the iodides, but is useful when they are

not well borne. Iothion is for local application only, the skin each day being painted with about half a drachm. Iodipin contains ten per cent.of iodine,which is combined with oil of sesame;it passes through the stomach unchanged,and is partly split up by the pancreatic fluid and bile,and partly absorbed as chemically-intact iodine in the intestine.It is thus partly stored up as iodipin, and the contained iodine is slowly liberated.It may be used either by subcutaneous injection or by the mouth. Lewitt(Deut.med.Woch.,May 16,1901)says that it acts as powerfully as,and even more so than,potassium iodide,and has the additional advantage of producing no symptoms of iodism;it is especially useful in syphilis of the lungs. Zirkelbach found that,when iodide of potassium had produced iodism,iodipin could be used without danger.Iddomuth is used by some for dressing syphilitic wounds, discharging surfaces,etc.;it is said to be clean,effective,and practical,as well as scientific.It is a preparation of bismuth containing twenty-five per cent.of iodine. It is reddish-brown in colour,thoroughly antiseptic and sedative,without,however,the unpleasant odour of iodoform and like preparations;it is superior to boric acid, in that it is more haemostatic. Calcium iodoricinolate is a preparation containing thirty-six per cent.of iodine, which is said to operate successfully in three-grain pills. Iodoglidine is highly spoken of in various quarters.It is usually given in five-grain tablets,the equivalent of a sixth of a grain of iodine being contained in each.It is said to have no unpleasant effects and an action of the most satisfactory sort,the parotid gland never becoming tender under its exhibition,even with the large doses that some patients can tolerate. Amongst the other substitutes for iodine that merely require mention are lipiodol,iodinol,and iodolen.

In certain cases syphilitic lesions respond better to the so-called mixed treatment than to either the iodides or mercury alone;this is particularly true as regards late secondary eruptions.The efficacy of the iodides is here enormously increased by the addition of a mercurial. In any case it is not a bad plan to give mercury after the termination of an iodic course. Potassium iodide and solution of corrosive sublimate may be prescribed together in mixture for this purpose, though there is no objection to giving the two separately: for instance,the iodide in mixture and the mercury in a pill.

ARSENIC.

Until within comparatively recent years,arsenic has never received anything like a vogue in the treatment of syphilis;the earlier writers seem to have tried it in washes with or without mercury,and from time to time it was recommended as a reliable tonic without reference to any specific effect.Orpiment and realgar were known even to the ancients.

Arsenic occurs in nature,and is a metal without odour or taste,a lustrous,crystalline,brittle mass of a steel-gray colour.The commercial white arsenic is prepared from the native ore by roasting and sublimation. In a pure condition white arsenic,-arsenic,acidum arsenosum,arsenous oxide,arsenous anhydride,arsenic trioxide,-is a white,amorphous powder,without smell or taste.It

is soluble in thirty parts of cold water and fifteen parts of hot;also in hydrochloric acid and glycerine. When thrown on a heated surface an odour like garlic is emitted,and there is a risk of being poisoned from the resulting fumes.Arsenic,when applied to the skin,acts as an irritant,its power as such,however,depending upon the concentration of the preparation applied.Mucous membranes are similarly affected.Great care must be exercised in its use in this way,as it is readily absorbed. Injections under the skin may be followed by pain,swelling,and even abscess and gangrenous processes.Vinay (Lyon Méd.,April 12,1896)says that subcutaneous injections do not give rise to digestive derangements,but determine local accidents despite all aseptic precautions; arsenical solutions become infected with molds,etc.,very readily,and cause irritation at the site of inoculation, pain,inflammatory infiltration,and sometimes even abscesses or gangrene;he tried the advocated method of using a sterile solution of arseniate of soda,but concluded therefrom that the method of subcutaneous injection will not be borne by the patient for long.The internal administration of small doses of arsenic stimulates the mucous membrane,thereby sharpening the appetite;but no other perceptible effects are produced.It raises the tone of the nervous system,increases the power of endurance,and promotes the circulation.It combines with the corpuscles of the blood and thereby improves them,with the result that the general condition of the patient undergoes improvement.The continued administration of the drug leads to a tolerance on the part of the system. Thus,the Styrian arsenic eaters consume as much as eight or ten grains at once,but take no liquids immediately thereafter,so that absorption progresses slowly and elimination by the kidneys rapidly.This tolerance for the drug is undoubtedly due,to some extent,to environment and heredity,for arsenic sooner or later poisons those who endeavour to imitate these people.Hutchinson says that arsenic,used for a considerable time,produces a tingling and numbness of the tips of the fingers. Regarding the effect of arsenic on nutrition,in doses of a third to a fourth of a grain,it increases the elimination of urea and phosphoric acid and diminishes the elimination of sodium chloride.In large doses,-that is, more than a quarter of a grain,-it diminishes the excretion of urea and increases the excretion of phosphoric acid and chloride of sodium.In small doses,the elimination of uric acid being augmented,nutrition is increased because the chloride of sodium,the stimulant par excellence of nutrition and preservative of the red blood-corpuscles,is retained in the organism in larger quantities than normal,thus stimulating nutrition,in spite of the loss of phosphoric acid.The contrary is the case when large doses are given,the unfavourable action being attributable,first,to the destructive effect of the drug on the red corpuscles,then to its action on the chloride of sodium,and finally to its action on the phosphoric acid.In large doses it gives rise to irritation,and even to gastroenteritis.The symptoms of such doses are usually burning or colicy pains in the epigastrium,nausea,diarrhoea,and,if the dose be sufficiently large,vomiting,purging,and pain all over the abdomen. The eyes of the patient will become puffy,particularly in the morning early.This may increase into a decided

oedema,and later may lose its local character and become general.Albumin and casts may or may not be found in the urine.This puffiness about the eyelids should be regarded as the physiological limit of administration in the vast majority of instances.The nervous system is stimulated by therapeutic doses of arsenic,whereas large ones or toxic doses depress or even paralyse it.The sensory apparatus is first affected usually,the reflex and motor following next in order.The reverse may,however,occur. It is generally believed that arsenic acts directly upon the nerve-centres through the changes in the cellular elements which are excited.Janowski(Zeit.f.klin.Med., Bd.xlvi.,1902,Nos.1-4)reports three cases of arsenical neuritis,the third being especially interesting because the left upper extremity was involved only.It is uncommon to see involvement of but one extremity,and apparently the left arm has been reported but once as being involved alone.A study of the literature clearly demonstrates that arsenical neuritis is most frequently due to acute intoxication with arsenic.Our author gives a series of two hundred and fifty-three cases,of which one hundred and thirty-six were due to acute poisoning.The condition most often affected the lower extremities and the peripheral parts,namely,the feet,the hands,and the lower part of the legs.The numerous cases reported of a widespread multiple neuritis in many cases of chronic arsenical poisoning shows that the long-continued use of the drug affects the peripheral nerves.Too large a dose of arsenic may give rise to tingling of the fingers,formications,headache,giddiness,and muscular tremors;while even convulsions may precede the paralysis of a lethal dose.Stockmann(Brit.Med.Jour.,Oct.18,1902)says that there is no doubt as to the possibility for eveil of small quantities of arsenic taken daily over a period of time.At the same time there is no doubt as to the great therapeutic value of arsenic in certain morbid conditions.He thinks that serious chronic arsenical poisoning as a result of the administration of this drug is a rarity,and that the tolerance of arsenic varies in different individuals and under different conditions. It is a well-known fact that the continued use of arsenic may lead to changes in the skin,which may be in the form of eruptions,pigmentation,and so forth.Foerster(Berl. klin.Woch.,Dec.8,1890)mentions a case of brown discoloration of the skin,produced by long use of arsenic,in a boy of ten years who suffered in consequence an exophthalmos and thyroid pulsation;he took in two months an ounce of the liquor potassii arsenitis;he was discharged improved,but in fifteen days returned,exhibiting a yellowish discoloration of the skin and face and trunk, which gradually deepened into brown.Hutchinson(Arch. Surg.,1894,Vol.v.,p.364)tells of a middle-aged woman, who had taken arsenic for more than a year,in whom the skin became deeply pigmented,the heels cracked and sore, and the palms and soles very dry;there were also numerous black freckles on the face.Cantrell(Med.Summary, Mar.,1896)once saw a case in which boils followed the continued administration of Fowler's solution.Jamieson (Eed.Med.Jour.,Jan.,1898)holds that,valuable as arsenic is as a medicine in certain ailments,if judiciously administered,it gives rise,if taken in even small doses for a long time,not merely a dinginess,but a positive pigmentation,of the general integument;on the palms and

soles it powerfully stimulates the sweat glands, occasioning first hyperidrosis of these regions, then to the formation of warty corns around the sudoriparous orifices, and finally to a diffuse hyperkeratosis, associated with burning sensations. Enriquez and Lereboullet (Gaz. Hebd. de Med. et de Chir., July 6, 1899) once had a case of arsenical melanoderma simulating Addison's disease, including the othersymptoms of the latter. The progressive weakness and intestinal disorders of Addison's disease are not, as a rule, present in arsenical melanoderma, and, moreover, in the latter case there are associated dryness of the throat and conjunctivitis. The pigmentation due to arsenic does not often affect the hands or feet, and the peculiar speckled appearance of the trunk is characteristic. It is noticeable that, whereas in most cases a protracted course of arsenic is necessary to produce pigmentation, in certain predisposed persons a few large doses will produce the same effect. Stich (Münch. med. Woch., Mar. 12, 1901) experimented with arsenic on snails, and observed a general dilatation of the lymphatics, increase in the quantity of pigment, and fatty degeneration of the protoplasm of the parenchymatous cells without any symptoms of inflammation; he found that plants were also poisoned, and that upon analysis they had absorbed very little of the poison. In ordinary medicinal doses arsenic promotes respiration, improves the circulation, and increases the secretions from the skin, the liver, the salivary glands, and the renal organs. The drug is very rapidly eliminated, and principally by the kidneys; but the process is also participated in by the mucous membrane of the alimentary canal, the skin, the teats, and the saliva. It has been noted that, when the drug is injected into a dog in such doses as to occasion acute poisoning, it is eliminated by the urine almost unchanged; the elimination, beginning immediately after the injection, is greatest during the first few hours, and continues for three or four days at the most. Even in cases in which small doses are given daily no traces of arsenic are discoverable in the urine; in cases in which rather large doses are given daily of ten or twelve days the elimination of arsenites goes on for a longer time than this. Arsenic, when given per rectum, is thrown out by the mucous membrane of the stomach in from fifteen to thirty minutes before the commencement of the elimination by the renal organs.

Regarding the toxic symptoms of arsenic, it may here be noted that the exhibition of the drug for a considerable period may give rise to chronic arsenical poisoning. The patient begins to suffer from languor, debility, anorexia, occasional vomiting, and a sense of discomfort in the region of the stomach. There may be abdominal pain and slight diarrhoea, but constipation is not usually observed. Later on, more serious symptoms occur, such as coryza, sneezing, hoarseness and coughing, and a general catarrh of the mucous membrane of the respiratory passages. Various skin eruptions make their appearance; the epithelium is proliferated and thickened, and a papular or vesicular or erythematous rash may be seen. The colour of the skin becomes darker, more especially in those of swarthy complexion. This condition is called arsenical melanosis. In bad cases there are nervous lesions and fatty degeneration of the internal organs. Peripheral neuritis is the most common ailment

and is generally,but not invariably symmetrical.Muscular atrophy,with diminished electrical excitability,rapidly supervenes.The extremities are more commonly affected than the trunk.Disturbances of sensation are not infrequent.Fatty degeneration of the viscera is due to the fact that the drug interferes with the oxidation of the tissues and has a destructive action upon the cells.In very chronic cases the patient may sink into an apathetic condition;and sometimes epileptiform convulsions have been observed.

The treatment of syphilis by means of the arsenical preparations has now become very popular,the researches upon trypanosomiasis contributing not a little thereto. Various forms may be used. The metal itself may be given in doses of a sixtieth to a twelfth of a grain.Liquor acidi arsenosi contains one per cent.of arsenic,and is given in doses of from one to ten minims. Liquor potassi arsenitis is of the same strength and dose,and is commonly known as Fowler's solution. Pearson's solution is used by some,and has the same amount of arsenic in it,being also of the same dose. About half a century or so ago,Donovan found that arsenic was a valuable adjunct to mercury in syphilis;and this led to his introducing what is now known as Donovan's solution,or liquor arsenii et hydrargyri iodidi,the dose of which is from five to ten or twenty minims, The iodide of arsenic may also be used in doses of a twenty-fourth to an eighth of a grain. The dose of the sulphide of arsenic is a twentieth to an eighth of a grain;that of sodii arsenias, a twenty-fourth to a twelfth of a grain;and of cupric arsenite,a twohundreth to a half-grain. Some practitioners use pills containing a twelfth of a grain of arsenious iodide and a similar amount of mercuric iodide,and report good results therefrom.

Arsenic is frequently given hypodermically - the liquor potassii arsenitis,for instance,in doses of from one to four minims; liquor sodii arsenitis is similarly administered to the same amount.Moyer(Ther.Gaz.,Jan., 1891)recommends for hypodermic administration arsenic, in the form of one part of anhydrous sodium arseniate to one hundred parts of water,the dose being about twice that of Fowler's solution. Scheel's green,or Paris green, is an impure arsenite of copper,and seldom used. Clemens had devised a solution,which receives his name,of bromide of arsenic;it is prepared by boiling fifty-seven and a half grains each of arsenous acid and carbonate of potash in eight ounces of distilled water and allowing the solution to cool,to which is then added sufficient distilled water to make eleven and a half ounces. To this are added one hundred and fifteen grains of pure bromine.The resulting solution is kept for four weeks, being frequently shaken during the first week,or until it remains clear.It is given in doses of from one to five minims - if by the stomach,well diluted after meals. An alleged non-toxic and easily absorbed preparation of arsenic is cacodylic acid,-dimethyl-arsenic kakodylic acid,-is obtained from cacodyl and mercurous oxide in the presence of water.It occurs in large permament prisms,slightly sour and odourless,being soluble in water and alcohol and melting at 200.C.Heitzmann (Med.New,Aug.17,1901)says that soda cacodylate is an excellent substitute for arsenic,and of especial value in cases in which large doses of arsenic must be given;

according to him,it is absolutely safe,even in massive doses,being non-toxic in comparison with other arsenical compounds;he gives it hypodermically in doses of from one to one and a half grains daily,and,by the mouth and rectum,six grains per diem.

The organic salts of arsenic are now largely used for the cure of syphilis. The important indication for the employment of these lies in the fact that much larger doses of arsenic can be administered without producing toxic symptoms of the metal than would otherwise be the case.

One of the earliest of the organic arsenical salts to be introduced is the well-known atoxyl.It contains a fraction over twenty-four per cent.of arsenic,and is a colourless,odourless substance of a cool and somewhat saline taste.It becomes brown on heating and decomposes slowly without fusing.It dissolves in about four parts of water at 20.C.,and there is about eighteen per cent. of the drug in aqueous saturated solutions at this temperature.It is practically insoluble,however,in alcohol, which will precipitate it from aqueous solutions,which themselves have a slightly acid reaction.Various tests have shown that atoxyl is forty times less poisonous than Fowler's solution;and from the preparation the arsenic is slowly liberated in physiologically-active form without any risk of cumulative poisoning.Some regard it as a specific for syphilis,and claim that its general and local atoxicity give it great advantages over mercury and potassium iodide,in none of the cases any intolerance being observed.Salmon(Compt.Rend.Hend. Soc.Biol.,March 22,1907)has tried atoxyl on a series of twenty-seven syphilitics,and says that it has decided advantages over other preparations in the following respects:"The certainty of the results.- The favourable healing effect shows itself in every stage of syphilis, primary,secondary,and tertiary;this we were able to confirm with regard to the following syphilitic phenomena:phagedenic chancre,roseola,papules,plaques muqueuses, gummata,and tertiary glossitis.The abatement of these forms of the disease under the influence of the treatment can be closely followed. The rapidity of action of the drug.- The arsenic is quickly absorbed and acts quickly. In two cases the headache disappeared eighteen hours after the injection. In five patients the papules had diminished visibly on the third day and had changed in colour.Ulcers and gummata improved in a few days,the dysphagia of the angina syphilitica abated in two to three days. The rapid healing of different forms of the disease.- To give a few figures:chancre of twelve days' standing healed in six days,general papules in seven days.Plaque muqueuse of the lip,1 cm.in size, closed in eleven days,plaque muqueuse of the lip,3 cm. in extent,healed over in nineteen days,psoriasis palmarum disappeared in eleven days,glossitis erosiva(three-years'-old syphilis)reduced in six days,tertiary ulcers (twenty-five-years'-old lues),of about 3 cm.in extent, decreased to a few mm.in eight days,gummatous osteoperiostitis of the shin bone reduced in eleven days. In one case,where the diagnosis vacillated between the tuberculous and the syphilitic nature of a tumour,the absolute lack of improvement after eleven days and fifty grains atoxyl showed syphilis to be out of the

question,which was confirmed by the failure of iodine and mercury. It is only necessary to take these facts into consideration,to appreciate that arsenic is at least as prompt as mercury in its action,which is regarded as specific against syphilis.I speak here only of the therapeutic effects of arsenic on already existing syphilitic phenomena,and not of its preventive qualities.We have given atoxyl in various doses from 7½ to 15 grains, which last we have never exceeded as maximum.In general, repeated doses of 12 and 15 grains occasion the patients no discomfort;we have more than one hundred times administered doses exceeding 7½ grains without ill effects. Thus the toxicity of atoxyl is very slight.A syphilitic patient received 98 grains in twenty-one days;in the case of a woman with cancerous cachexia and albuminuria, 45 grains in eight days were prefectly well tolerated. If will naturally sometimes occur,if rarely,that large doses of atoxyl are followed by symptoms of intolerance, as nausea,vomiting,and colic,which make their appearance ten hours after the intramuscular injection.This temporary indisposition lasts for four hours and is easily allayed by opium,being only observed in persons with a weak power of resistance.We have observed these effects in cachectic cases and in a syphilitic patient much weakened by chronic stomatitis mercurialis.We would advise in practice doses of 7½ grains,repeated every other day for two or three weeks;for this a 10 or 15 per cent.solution should be employed,which has been sterilised for two minutes at 100.C." The result of Salmon's advocacy as thus expressed was that observers in other countries made careful investigations into his claims. Lassar was one of the first to do so,and reported his disbelief in the administration of the drug,which in several hundred of his patient was without influence at all.But he soon changed his opinion(Atoxyl in Syphilis,Berl.med.Gesell.,May 15,1907),for he states that he renewed his experiments on another series of cases. "At first,"he remarks,"the doses were increased slowly.No case of ill effects has occurred.Despite this,care must always be observed when handling a medium of still unprobed qualities.This restrained me from initating the dosage frequently administered by Salmon.I had the less occasion to do this as 7½ grains in 10 per cent.sterilised solution three times weekly sufficed to produce a prompt abatement of the syphilitic symptoms,and this whether the cases were fresh or of long standing.It is almost superfluous to remark that the cases selected for these observations had previously been subjected to no treatment whatever,least of all the iodine or quicksilver.Although an earlier mercurialising does not in point of fact,as might have been assumed,in the least interfere with the influence of the new remedy,still from the critical point of view only fresh patients furnish conclusive proof.At any rate this is the material on which the proof has been given.Primary sores are absorbed after a few atoxyl injections in the gluteal region - precisely as after corrosive sublimate injections.Any exanthema already present pales into invisibility.Papules lose their redness,and with the disappearance of the plastic exudation,flatten out and acquire a characteristic brownness - retrograde metamorphosis. Ulcerations close and skin over,annular syphilides dry up,and gummatous infiltrations yield to the treatment in

like manner.This,so far as has been ascertained,the different stages of development are equally affected by the therapeutical reaction.This behaviour corresponds exactly to the action of mercury,which exercises a like exterminating influence at the period of infection,and on all intermediate and final phenomena,as far as they are susceptible to treatment whatever.Existing methods of treatment have therefore been supplemented by another specific remedy,atoxyl,administered in large doses;an advance of far-reaching theoretical and possibly practical importance.The medical profession,it may be hoped, will sooner or later gratefully recognise the fact that atoxyl presents for inquiry an hitherto unknown means of combating syphilis.It is of practical importance to investigate its action on the affections of the central nervous system,which have up to now defied iodine and mercury."Hollopeau(On the Treatment of syphilis by the Arylarsomate of Soda according to the Method of M.Paul Salmon)treated seventy-two cases by intramuscular injections.of a ten per cent.solution in doses of from 7½ to 12 grains,three times a week.He found that from five to nine injections were needed in non-mercurial cases and those resisting the action of that specific."The favourable results,"he says,"thus obtained by us confirm those of Salmon.The effect of the preparation was almost striking in cases of roseola,papulous syphilides, and tertiary ulcerations.Exostoses were reduced,and pains rapidly abated.In a patient with syphilis maligna precox,with symptoms for two years under out observation withstanding any intensive mercury-iodine treatment,six injections of 12 grains sufficed to heal ulcerations of the size of a shilling.Secondary ulcerous syphilides were,however,more stubborn.In such cases there are mixed infections,but we saw cases of papulo-ulcerous syphilides on the vulva,which as a rule are exceedingly stubborn,give way to the treatment."Dealing with the symptoms of intolerance,which in one hundred and twenty-four cases only became serious on four occasions,he remarks: "Should these incidents lead us to abandon the use of this most efficient remedy?No,not in the least,no more than the toxic effects of other drugs,as opium,chloroform,mercury,digitalis,cocaine,etc.,exclude them from practical medicine.As a matter of fact,scarcely a drug of value exists which,if wrongly administered or in too large doses,has no toxic effect."Later he adds:"If,as we have reason to hope,syphilis can be favourably influenced by the new arsenical preparation,we are justified in regarding these symptoms of intolerance,however,disagreeable,as of secondary importance.Yet every means must naturally be sought to avoid these ill-effects,and we trust to be successful in this search." The usual custom in making atoxyl injection is to use a ten per cent. solution,which is equivalent to seven and a half grains; women require about six grains,and in men nine grains have sometimes been administered.The drug is injected into the muscles every other day,and every third day towards the end of the course.In not a few instances, it is said,the result is the disappearance of all the syphilitic symptoms,and now and then with striking rapidity,particularly in early cases.Lesser reports a considerable increase in the weight of the patients,and sums up his observations by saying:"The preparation causes the disappearance of the visible symptoms of

syphilis with more or less rapidity, and in this respect in many cases, especially in galloping syphilis, it appears to stand on an equal footing with colomel injections, the best method of treatment hitherto known. The discovery of this new means of combating the symptoms of the disease may thus be already regarded in certain cases, as for instance when the organism is especially sensitive to quicksilver, as a valuable enrichment of our therapy." Neisser has very carefully investigated the claims of atoxyl (Deut.med.Woch., 1907, No.38), and concludes as follows: "We are already in possession of a whole series of reports with respect to the employment of atoxyl in syphilis. These affirm good results in the healing of existing symptoms, but adopt no definite attitude towards the question whether a complete destruction of the virus present in the body is attainable, and this recurrence of the symptoms excluded. After our experiments on animals I am able to assert that the atoxyl treatment, if energetically prosecuted, large single doses being most effective, has a powerful influence on syphilis. Our experiments concerned less the influencing symptoms - though we were able to observe a most brilliant success in an orange-outang, in which two aggravated and brownish-red infiltrations, of the size of the palm of the hand, which had persisted without alteration for weeks, healed completely after injections of 1½ grains of atoxyl - than with the virus in the bodies of the animals experimented upon. Whilst inoculations from the organs (spleen, bone-marrow) of animals in which the disease was left to itself or treated with various other drugs, almost invariably led to positive infection, inoculations after atoxyl treatment almost invariably gave negative results. Whether a complete sterilisation was obtained or only such a degree of annihilation that the remaining traces escaped transmission by the organ inoculation, has not yet been ascertained." The curative power of atoxyl in the syphilis of apes has also been demonstrated by such competent authorities as Uhlenhuth, Hoffmann, and Weidanz; an ape was inoculated, - the syphilitic symptoms having been cured by atoxyl injections seven months previously, - with fresh syphilitic virus which gave rise to the usual chancre. Our authors concluded that in all probability "syphilis in apes can to a certain degree be cured by atoxyl treatment, and that after a time, in our case after about seven months, full receptivity to the syphilitic virus is again present. Subsequent injections of syphilitic apes scarcely ever produce any symptoms at this period (Neisser) experience having shown that within so short a time of the first inoculation the skin is completely immune; at most, according to present observation, there may be produced at the point of inoculation an insignificant papule." From all these observations it would appear that we have in atoxyl a specific for syphilis, which also is said to prevent the outbreak of the symptoms of that disease. Thus, Uhlenhuth, Hoffmann and Weidanz (Deut.med. Woch., 1907, No.39) inoculated a series of rabbits with syphilitic virus in the cornea; some of them were placed upon atoxyl, and the rest kept under observation as controls. None of the animals who received the atoxyl regularly developed syphilitic inflammation of the cornea or affections of the iris; whereas most of the control animals suffered markedly from syphilitic

ketatitis.So also Metchnikoff has demonstrated that apes injected with syphilitic virus can be prevented from manifesting specific symptoms by atoxyl injections, provided the operation be performed within eight to fourteen days.He inoculated seven apes with the same specific virus, and two of them he during the incubation stage injected with atoxyl.The latter had nosyphilitic symptoms,whereas theother five apes had chancres.Atoxyl has also been used with more or less success in parasyphilitic affections;but it appears to have more or a prophylactic than a remedial effect in this respect.The injections of atoxyl do not cause pain,though toxic phenomena have been known to arise.These consist of diarrhoea,sickness and vomiting,which can be relieved by opium;later there may be such severe symptoms as peripheral neuritis and paraplegia.The injections must then be stopped,and mercurial injections substituted until the atoxyl phenomena have entirely disappeared,when the latter remedy may be resumed.Blindness has also been recorded from the administration of this drug.Its alleged atoxicity is therefore far from proved.

The arylarsonates now enjoy a considerable vogue in the treatment of both syphilis,trypanosomiasis,and kindred affections.The introduction of these organic arsenical salts was a gradual process and met with some oppsition from those who could see no advantage in such attempts to oust mercury from the honoured place in the therapy of the disease which it had for centuries enjoyed,though at first more or less empirically used. But the disadvantages of mercury came more and more recognised,particularly as regards the inflammation of the gums,the diarrhoea,the gastrointestinal disturbances, and the like.The first step towards the more rational treatment of this disease was taken by Schaudinn who,in 1905,established,to all intents and purposes,the spirochaete pallida as the one and only cause of syphilis;this organism is one of the order of prytozoons, which also produces the trypanosoma gambiense,the cause of sleeping sickness. Prior to the world-famed investigations of Castellani,Bruce,Nabarro and Low on the nature of the latter affection,it had been observed that tsetse-fly disease in horses,oxen,etc.,could be cured by arsenical preparations,which exhibited a trypanocidal action and destroyed the casual agent in the blood.It was therefore concluded that arsenic might prove curative for human trypanosomiasis diseases -indeed,even specific.Syphilis is as much a protozoal disease as trypanosomiasis,so why should not it also be cured in this way?That arsenic could benefit syphilis was apparent,as some of its less active preparations,such as realgar and orpiment,were well spoken of from the beginning of the Christian Era. Forthwith on the introduction of these organic arsenical salts of low toxicity,it was seen that arsenic could be given in comparatively large doses without unpleasant effects and with greater benefit to the patient.The organic arsenical salts in question were the arylarsonates, which beloneged to the aromatic series,consisting of arsenic in combination with an aromatic radicle.About half a century or more,Béchamp used an arylarsonate called sodium amino-phenylarsonate,though popularity failed to attach to it,until Thomas and Breinl showed that it has a lethal effect upon sleeping sickness,in the treatment of which affection the Liverpool School

of Tropical Medicine have established its efficacy.Koch cured several cases with the remedy in Uganda,and even the most sceptical were thereafter convinced of its reliability.The organic arsenical preparations were largely used on the Continent by such competent observers as Uhlenuth,Lassar,Hollopeau and Salmon,and their successful pioneer work still further contributed to the therapeutics of the disease.But it was soon seen that the arsenical prpparations used did not act alike,and that there were variations in the chemical composition of these drugs.Sodium aminophenylarsonate,for instance,was an inconstant salt,with its percentage of arsenic influeneed bu its mode of manufacture and the quantity of water of crystallisation which it contained.Some of the arylarsonates were found to have a more toxic action than others,with the result that some cases of poisoning were observed,and the method for a time fell into disrepute The matter was fully investigated by Messrs.Burroughs Wellcome & Co.,of London,in 1907,with the result that they introduced three arylarsonates,to which they gave the proprietary names of Soamin, Orsudan,and Kharsin.

It was seen that arsenic acid could have one or more of its hydroxyl radicles replaced by an organic group,and a lowering of toxicity would result therefrom. Arsonic acid was the product of the substitution of an organic radicle for one hydroxyl radicle.Arylarsonic acid resulted from the substitution of an aromatic or benzene series,and a sodium salt of aminopheynyl arsonic acid constitutes Soamin,which is a pure and stable form of sodium para-aminophenylarsonate.It is soluble in three or five parts of water at from 60. to 98.5.F.,and then gives a neutral solution which will not undergo decomposition when sterilised by boiling for five minutes. About twenty-two per cent.of arsenic is contained in it, and it is said to be forty times less toxic than arsenious acid.It is incompatible with acids,quinine,and solutions of the heavy metals. Numerous experiments were made with Soamin in syphilis,and some of the results were remarkable. The first report appears to have been published in April,1908(Jour.Roy.Army Med.Corps,April, 1908),and comprised a series of thirty rather severe cases of syphilis,and all of them undoubted instances of the disease.In none of them did intolerance or toxic phenomena appear;indeed,in none,except perhaps one,a single unpleasant sensation that could be positively referred to the action of the remedy.All the patients made excellent progress,and gained in weight from the very commencement of the treatment.The benefits arising were most obvious in those cases in which the patients suffered from ulcerations of the tongue, mouth,or throat.Five of them improved wonderfully after even the second injection of Soamin,"by which time the ulcers had already assumed a much cleaner condition,and healthy granulations had appeared.In the course of a week,what had been a foul,dirty,syphilitic ulcer had completely healed.The remedy was administered in doses of six grains per diem on alternate days until between fifty and sixty grains in all were given;all the symptoms usually disappeared after eight to ten injections had been practised;in the later cases,the first two or three injections contained nine grains a day,followed by six-grain doses.Three of the cases are fully described in the report,and the most important points may

may be epitomised as follows: Case I.was admitted on October 29th,1907 and discharged on January 27th,1908; he gave an indefinite history and said that four days ago some spots appeared on his face.Examination revealed the presence of large condylomatous masses covering the scrotum and neighbouring parts of the thighs;in the latter situation they were of large size and prominence, elevated a quarter of an inch or more from the skin,and were moist and discharging a mucoid material.Large, stinking condylomata were also seen on the perineum and anus and adjacent parts of the nates.The legs,arms,face, and the whole of the trunk were covered with large dull-red papules.Characteristic syphilitic cachexia was well marked,and the patient seemed very ill.On the glans penis there was a scar from an ulcer,and the prepuce was hard and cicatrised.The urine was normal,and the weight of the patient twelve and a half stones.The day after admission the patient was injected with six grains of Soamin,and the operation repeated with this quantity every other day until eight injections in all had been practised.The injections were temporarily suspended after forty-eight grains of the remedy had been administered.On December 13th,that is,about six weeks after admission,there was seen to be some ulceration at the angles of the mouth,and the cicatrices of the growths on the thighs and scrotum were a little elevated.The injections were on this day resumed in the same dose, and repeated every other day for six times,being stopped on the 23rd inst.The patient complained of ulceration of the fauces on January 13th,1908,so he was given nine grains of the remedy every other day four times,one hundred and thirty-two grains being the total amount administered from admission to discharge.It appears that the condylomata began to take their departure five days after the initiation of the Soamin course,and that by the tenth day great improvement was observed,the eruption having disappeared,the condylomata being smaller and not so moist,and the urine free from all abnormality. When forty-eight grains in all of the remedy had been administered,that is,by the eighteenth day when the injections were stopped, the eruption had quite gone,and the condylomata were of very small size.On Novemeber 25th,the patient had no symptoms;he congratulated himself on feeling so much better,and it was seen that he had increased two pounds in weight;by December 18th he had put on another half-stone.On December 19th,after the fourth injection of the second course begun on the 13th inst.,the growth had quite gone again,and healing of the ulcers at the angles of the mouth was observed. On the 23rd he was carefully examined and was found to be without syphilitic manifestations.On January 24th, 1908,he was equally free from taint;he looked in robust health;and his weight was now over thirteen stones. Closely questioned,the patient said that he never felt the least unpleasant sensation from the Soamin course. Case II.was admitted on February 19th,1908 and exhibited on the lower lip a large hard ulcerating growth, equal to a walnut in size.There was considerable induration of the mucous membrane and surrounding tissue.At the angle of the lower jaw on the left side was a hard glandular mass of considerable size.The entire body was covered with a faint roseolar eruption on the fifth

day.Every other day nine grains of Soamin were injected, the primary lesion being dressed with an ointment of twelve grains of the remedy to the ounce.The reporter states that at the time of writing "the patient had taken 45 grains of the drug by injection,the chancre itself is much smaller and looks much cleaner,and the patient states that he is free from pain.The glandular enlargement at the angle of the jaw has almost disappeared;the rash entirely vanished four days after its appearance".He describes the case as presenting the "largest and most typical extra-genital chancre we have ever seen".The writer expresses himself well pleased with the drug in causing the above effects,and add that,as regards its capability of being permanently curative,it is"too early to say how many courses of injections are necessary to completely stamp out the disease.There still remains a considerable amount of work to be done in connection with the treatment,but we feel satisfied that in this sodium para-aminophenylarsonate/we/have a valuable agent in the treatment of syphilis.Its immediate action on the lesions of early syphilis would appear to be quite equal to,if not better than,that of mercury.It has many advantages over mercury,without any disadvantages.It is very easily injected,and it dissolves readily in distilled water.The injections are absolutely painless.There has not been one single complaint of pain or tenderness after injection,nor the least suspicion of induration or thickening.Injection of the drug is never followed by salivation or spongy gums,which is such a frequent complication with mercury.And,lastly,it should be of special value in India and tropical countries when the patients,already debilitated by disease and climatic conditions,are unable to take mercury in any form,whereas this drug should have a tonic or alterative effect". Some thirty more observations were later published(Brit. Med.Jour.,Aug.15,1908)on the action of this remedy in syphilis,which was given in doses of ten grains every other day,until one hundred grains in all had been administered;at first,however,six grains only were given, but the larger dose referred to in the later cases which tolerated it quite readily.Thirteen of these cases present very interesting features,and are worth citation in summary of salient points:Case I.was admitted on April 22d,1908,with a large hard chancre at the root of the penis,shotty glands in the groin and back of the neck,a roseolar eruption all over the body,and a complaint of evening cephalalgia.He was forthwith put upon six-grain doses of Soamin,but ten-grain ones later on.The result was that the active symptoms of the disease,with the exception of the adenopathy,disappeared.He received one hundred grains up to May 30th,and had no further development up to the time of his discharge.Case II.was admitted on April 3d,1908,for a simple chancre which had yielded to local applications,but later took on indurative tendencies.He was given ten-grain doses of Soamin every other day until one hundred grains(the amount of the course)had been taken.All the syphilitic symptoms, including the induration,vanished,and the patient at the time of his discharge was nearly half a stone heavier then heretofore.Case III.was admitted on April 3d, and discharged on April 27th,1908.There was an induration at the scar of a recent circumscision,and there was a bullet-like enlargement of the glands in the inguinal,

cervical and mastoid regions.He was given the Soamin course as in the previous case,with the result that the general health improved,the induration vanished,and the weight increased ten pounds.Up to the time of writing (July 15th,1908)he remained free from syphilitic manifestations.Case IV.was admitted on April 22d,and discharged on May 27th,1908.There was a hard phagedenic chancre on the prepuce;the glands of the neck,mastoid and inguinal areas were enlarged and shotty;the throat was much ulcerated;and the trunk was covered with a profuse maculo-papular rash.The Soamin course was given,with another one of fifty grains after discharge.The chancre very quickly healed;the induration vanished;the general health improved;and over half a stone in weight was gained.Case V.was admitted on April 27th and discharged on May 19th,1908.There was a hard parchment-like chancre on the prepuce;the deeply-located glands of the neck and groin were markedly enlarged;the trunk was covered with a roseolar eruption;and the fauces were considerably ulcerated.The usual Soamin course was given,with the result that the syphilitic symptoms disappeared,and the patient put on half a stone in weight.Case VI.was admitted on May 21st,1908 and discharged on the 20th of the following month.He had induration at the scar of a circumcision;the neck and groin glands were very hard;sore-throat was complained of;and the trunk and lower limbs showed a ripe crop of maculo-papular reash.A full course of one hundred grains of Soamin was given,which resulted in the disappearance of the symptoms,and a gain of eight pounds in weight;even the throat and tongue were cured without any local medication.Case VII.was admitted April 27th,1908 and discharged on the 25th of the following month.This man had been previously medicated for what was regarded as a soft chancre;but on admission it was found that this was in a broken-down condition and surrounded by a rinf of characteristic syphilitic induration.The full course of Soamin was given;the chancre healed up,the induration disappeared,and an increase of four pounds in weight was observed.None of the manifestations of the disease thereafter appeared.Case VIII.was admitted on June 22d,1908 and discharged on the 20th of the following month.The patient had been previously treated with mercurial inunction for a slightly indurated chancre on the glans penis;but when first seen no induration could be detected - merely cervical and inguinal adenopathy,a generalised roseola,ulceration of the tongue and fauces,and marked debility.The full course of Soamin was given, with the result that all the active syphilitic phenomena disappeared and the patient was rapidly cured.Case IX.was admitted on April 30th and discharged on the 28th day of the following month.He had a typical hard chancre at the base of the foreskin, and the spironema pallida was demonstrated in it by the usual means.The full hundred-grain course of Soamin was given;the induration disappeared,and no further symptoms of the disease were observed.Case X.was admitted on May 10th,1908 and discharged on the 25th of the following month.There was a typical hard chancre on the glans penis,in a smear-preparation from which the specific parasite was found;the usual adenopathy of the disease was observed,as well as a profuse maculo-papular syphilide on the trunk and extremities,with ulceration of the throat,and marked general anaemia.The full course of

Soamin was given;the patient put on over half a stone in weight,the general health improved,and all signs of syphilis disappeared.Case XI.was admitted on May 10th, 1908 and discharged on the 20th of the following month. The site of an old chancre showed a parchment-like induration;there were no glandular abnormalities,but the spironema was discovered in the fluid of the indurated part.The full course of Soamin was given,and the patient was speedily cured.Case XII.was admitted on June 3d with several chancres on the glans and foreskin,two of which were markedly indurated and contained the spironemal; there was the characteristic adenopathy,and also the usual roseola;the throat was ulcerated,and the patient suffered severely from night pains.The full course of Soamin was given,and all the active signs of the disease soon took their departure and exhibited no tendency to return.Case XIII.was admitted on June 11th,1908 and discharged on the 29th of the following month.The site of an old chancre exhibited induration;adenopathy was present in the neck and groin;the throat was ulcerated, the trunk and limbs were covered with a roseola;and the patient was very anaemic.The full course of Soamin was given,and the disease was speedily cured.The beneficial effects of the remedy over secondary ulcerations was very marked,and it is usually found that when the remedy is regularly used syphilitic angina is of comparatively rare occurrence.In none of these cases were any signs of toxicity seen;so that the claims of many that Soamin is a second specific for syphilis would seem not without foundation in fact.Several other series of cases treated with Soamin have from time to time been published;in some even larger doses than the above-mentioned were used,but without the production of toxicity.In most of them the drug overcame the active symptoms,and the patients put on flesh and secured much improvement in health.A writer in one of the medical papers(Medical Press & Circ.,Nov.4,1908)draws attention to the fact that,whatever may be the efficacy of mercury in syphilis, some of the cases do far better on Soamin;and gives three principal indications for its exhibition:"(1)Patients who cannot tolerate mercury in sufficient amount to relieve their symptoms.This is most often noticed in cases where extensive ulceration of the throat and mouth is present.Soamin has proved of great benefit in the treatment of oral lesions.(2)Patients who have syphilis complicated with tuberculosis.(3)And patients who will not undergo a long course of mercurial treatment.These are unfortunately only too common in hospital practice.I believe that a few weeks of 'Soamin' injections gives a far better chance of warding off further development of the disease than a single short course of mercury."The conclusion is also expressed:"Though I have only been using this drug for a short time,I have found that, whatever it may eventually prove to be,it is a very valuable addition to the surgeon's armamentarium in his fight against syphilis."The successful treatment of old-standing syphilis is well illustrated on another of the published cases(Med.Press & Circ.,Nov.11,1908):"This patient,"the writer informs,"a married woman,had contracted syphilis ten years previously from her husband,and the disease had run an unusually severe course,uninfluenced by treatment,until she was covered with ulcers and practically bedridden.During the autumn a course of

intramuscular injections of 'Soamin' had been begun with marvellously good results, and the ulcers had, in nearly all cases, cicatrised. A case is reported in the "Lancet" (Dec.26,1908,p.1880) in which syphilitic ulcers rapidly yielded to four injections of the remedy; and about the same time its efficacy in cases of intractable veneral sores was also pointed out (Brit.Med.Jour.,Dec.12,1908,p. 1788). Sveral cases have been published (Ibid.,Aug.28, 1909) to demonstrate the remarkable value of this arylarsonate in chronic tertiary cases which were utterly unaffected by mercurials, the usual Soamin course effecting a cure in even the most obstinate and worst possible complications of that period. It appears that (Ibid.,Aug. 4,1909) at one of the military hospitals the surgeons, from the commencement of its exhibition, in August,1907, to date treated and cured one hundred and thirty cases in this way, including syphilitics in all stages.

Orsudan, or sodium 3-methyl-4-acetylaminophenylarsonate, is a preparation which contains 25.4 per cent. of arsenic, an acetyl radicle being introduced into the organic compound with a view of reducing the toxicity. It has a complicated formula, and is distinguished from the other preparations of its class by its greater solubility, being capable of solution in three times its weight of water, yielding a neutral solution. It may be sterilised by boiling, and being a fifth or a sixth less toxic than Soamin, it is the least toxic of the three arylarsonates we are considering. It has been used largely at the London Lock Hospital (Clin.Jour.,Feb.3,1909,p.257), from which the report comes that "the results are, in my opinion, most satisfactory, and such as could not have been obtained by any form of mercurial treatment, not even by intramuscular injections of calomel, which I have hitherto regarded as the most efficient treatment of syphilis, and the one which has caused the most rapid disappearance of symptoms, and also the one from which relapses were least frequently encountered." The writer adds: "Another powerful argument in favour of this treatment, especially if the disease is encountered in its primary stage, is that by its agency the customary secondary symptoms appear to be completely abolished; now, it is by these secondary lesions that the disease is to a great extent propagated, mucous tubercles about the genitals or on the buccal mucous membrane being a most fruitful source of contagion, for the patients are so frequently ignorant of their significance and danger. If, then, these sources of contagion are abolished, the spread of the disease must be to some extent modified, so that from the point of view of prophylaxis the treatment is a valuable one. Several series of cases have been published in which Orsudan was given in ten-grain doses, dissolved in thirty minims of distilled water at a temperature of 100.F., the course being the same as that of Soamin, namely, ten grains every other day until one hundred grains have been administered.

Kharsin, or sodium 3-methyl-4-aminophenylarsonate, is an organic arsenical preparation containing 23.7 per cent of arsenic. Its toxicity is about equal to that of Soamin, and it is soluble, with the formation of a neutral solution, in two and a half times its weight of water. Its issue has now been withdrawn by the manufacturers, though it is said to have had a markedly beneficial influence over the course of the disease.

Arsacetin, or sodium acetyl-phenyl-arsonate, is an organic arsenical preparation of later introduction than the above, and emanates from Germany. It is a white crystalline powder, soluble in ten parts of cold, and about three, of warm water, giving a slightly acid solution. It is less toxic than atoxyl and is better tolerated. It can be preserved for a consierable period without decomposition, and boiling does not interfere with its action. Its solutions are extremely stable, and bear heating to 130.C. without liberation of the arsenical content; there is neither arsenious nor arsenic acid in combination with it. As a remedial agent it merits a trial.

Soamin and Orsudan may be given either orally, intramuscularly, or subcutaneously. It would appear that small doses of these drugs may be given by the mouth without the production of toxic symptoms; a quarter to one grain is usually given orally three times a day, one to two hours after meals, the maximum dose not exceeding three grains. The intramuscular method, however, is the popular one, and for it large doses are required, which, given by the mouth, would be decomposed by the stomach secretions and occasion toxicity. The injections are usually made in the buttocks, about the upper third thereof, and in the middle of a line which joins the anterior superior iliac spine to the top of the intergluteal fold. A glass syringe is used, having a platino-iridium needle; the required dose of the arylarsonate is drawn into this, after sterilisation by boiling for five minutes and after due disinfection of the site of operation, and the needle is driven well home into the gluteal muscle to the extent of nearly two inches, and the remedy is slowly and forcibly injected into the part; the wound is dressed with collodion after the injection of the entire dose. The patient experiences little or no pain, any unpleasantness being due to the wavering of the needle-point or the injection by its bulk distending the sensitive parts. Spraying the site of operation with ethyl chloride will allay the fears of nervous patients, who after the operation should remain at rest. The subcutaneous method is preferred by some, but is, in my opinion, inferior to the foregoing one. To carry it out, ten grains of Soamin are dissolved in at least two drachms of water; in the case of Orsudan less than that amount will suffice. If this dilution be not made, the patient will for weeks suffer from hard and painful subcutaneous lumps. After the injection any traces of the drug must be flushed out of the needle track by injecting sterilised water. Firm pressure is then made with the finger over the wound, and then the puncture is dressed with cottonwool and collodion. The strictest antiseptic precautions are required in this method. Arsacetin is, in sterilised ten per cent. solution, injected either intramuscularly or subcutaneously, usually twenty injections of ten grains twice a week being sufficient. It does not give rise to any serious toxic effects, except perhaps, in certain cases, transient pains in the stomach and intestines, especially in women, and a sudden and passing rise of temperature. It can be given immediately before or after mercury; and in this respect it has an advantage over Soamin. Some give it by the mouth in doses of a quarter of a grain three times a day.

It was formerly thought that mercury and the arylarsonates were not compatible and could not therefore be administered together. But it has since been demonstrated that they are compatible both chemically and

physiologically,and assist one another in their combat against the disease when jointly exhibited.In this way they are much used nowadays.

Patients having an idiosyncrasy to arsenic may show signs of toxicity,and then the drug must be withheld. These symptoms of intolerance are nervousness, restlessness,particularly at night,dermatitis,sickness, vomiting,and pains in the epigastric region. They are, however,of the rarest possible occurrence. There seems not the slightest doubt that in the arylarsonates we have valuable remedial agents in syphilis,though it is scarcely likely that they will ever displace mercury and iodide of potassium from the therapy of the disease.

SPECIAL TREATMENT.

The special or local treatment of syphilis takes into consideration the important fact that topical applications,in conjunction with the constitutional treatment above outlined,will more readily than otherwise remove the protean expressions of the disease.

CHANCRE.

The primary lesion of syphilis must be treated according to the most stringent antiseptic rules;and the part must be given absolute rest and freedom from all forms of irritation.In general,caustics are to be avoided;the only exceptions to this rule are mixed sores,with a minimum of induration,and exulcerated sores that become sluggish and refuse to heal after induration has nearly or quite disappeared.In the first instance pure carbolic acid followed by fuming nitric acid is admissible;but the galvanocautery,preceded by cocaine,is better.In sluggish ulcers stimulation with silver nitrate may be tried.In addition to keeping the parts as clean as possible,they ought to be kept dry.The old-fashioned black and yellow washes are serviceable,although the parts cannot be kept dry under their use.A solution of perchloride of mercury,1 : 1000,is very useful.a plan recommended for the application of the perchloride is to wash the lesion with a weak solution of common salt.Calomel is now sprinkled upon the part,a small amount of nascent and active perchloride being thus formed;this method also acts well in the case of condylomata.The best absorbent is powdered oleate or stearate of zinc,but benefit also follows the application of ordinary calomel.When a chancroid complicates the chancre the best treatment is perhaps the application of pure carbolic acid,followed by dusting with iodoform power.In these cases Unna(Monats. f.prakt.Derm.,1898,No.26,p.6)has used the following treatment successfully:The ulcer and the surrounding skin are first washed with soap and water,and then with perchloride lotion.After this the chancre is frozen with ethyl chloride,and the superficial layer of the chancre is removed with a sharp razor.The haemorrhage is controlled with a stick of silver nitrate touching the raw surface.The wound is covered with iodoform powder,and a zince-oxide plater is applied.This plaster should be removed every twenty-four hours.Grivzoff(Berl.klin.Woch., 1899,No.50)says that sodium soziodolate is of great value in chancroidal cases,being quite free from odour and non-poisonous;at first it should be mixed with some inert powder as at first it is apt to cause a smart

burning pain when applied, but after a few days the affected part grows less sensitive, and the pure preparation may be used freely. It must, however, be remembered that all local applications are useless for aborting constitutional syphilis, but are of service in hastening the cure of the local disease. Sluggish granulations should be touched with a five-per cent. silver nitrate solution. Gangrenous and phagedenic chancres call for destructive cauterisation, with nitric acid or acid mercuric mitrate, the surrounding tissues being protected with oiled cottonwool, and antiseptic fomentations following. There are a number of excellent dusting-powders now available; but the general opinion that iodoform, despite its nasty odour, is the best; It may be applied pure or mixed with powdered boric acid, or as a ten per cent. ethereal spray. Calomel mixed with an equal quantity of lycopodium is a satisfactory topical application. Dermatol is an astringent, healing antiseptic, free from irritating properties and devoid of unpleasant odour. Aristol is also of service. The dry powder is inert: hence it should be dusted on the surface of the chancre and a drop of olive oil allowed to fall on it from a glass rod; it should then be covered immediately with some thin, impermeable substance, under which solution slowly occurs. Twice daily the dressing should be renewed. When crusts are not present, or when there is but a slight inflammatory reaction, flexible collodion containing a tenth part of iodoform or a hundreth part of sublimate may be used topically. When a phimotic prepuce conceals a chancre, irrigation with a 1 : 2000 solution of corrosive sublimate, by means of a catheter passed under the foreskin and communicating with a resevoir four or five feet above the patient, will be necessary. Circumcision should be performed in the absence of benefit from this method. Paraphimosis calls for reduction by the application of heat, free dilatation, and elevation of the penile organ. In certain cases the reduction may be facilitated by keeping the part dry, and covering the glans with a solution of equal parts of a ten per cent. solution of cocaine and a 1 : 1000 solution of adrenalin. Failing this, the constricting bands must be incised, or sloughing will occur. In addition to the black and yellow washes, lead lotion, and salts of mercury, various other antiseptics have been recommended for washing chancres - e.g., cyllin, izal, protargol, lysol, argyrol, and protargol; indeed, their number seems yearly increasing. I have tried all these and many other proprietary preparations, but consider the officinal preparations quite as serviceable. As stated, iodoform still holds first rank in the topotherapy of this disease, despite the unpleasant odour emanating from this yellow, crystalline, insoluble powder. It is readily decomposed in the presence of alkaline fluids and in proteid solutions - this also occurring in wounds. Some of the drug is from the latter absorbed unchanged and circulates in the blood, with sometimes the production of toxic symptoms, particularly in the case of children. The toxic phenomena resemble those of alcoholic poisoning, and are usually announced by the occurrence of anxiety, depression, and general discomfort. Restlessness, insomnia, giddiness, headache and cerebral disturbance then supervene. The characteristic cerebral symptoms are mania and delirium,

but stupour and collapse may occur without signs of cerebral excitement.Death may result from fatty degeneration of the liver,kidneys,heart,and muscles.There are a number of theories extant to account for this action of the drug,none of which is quite satisfactory.In view of all this,various substitutes for iodoform have been proposed.One of the earliest of these was iodol,which is tasteless and odourless,but toxic.It was soon,however, replaced by such preparations as aristol,sozoiodolate of potassium or of mercury and zinc,as well as orthoform, europhen,losophan,and nosophen.There are several others of anodourless,tasteless,and less toxic kind;but for such properties they undoubtedly sacrifice efficiency,and should therefore never be used in such cases as tolerate the application of the reliable prototype,iodoform. The extragenital chancres call for treatment in the same general principles.Thus,syphilitic lesions of the tongue, mouth,or tonsils require frequent gargling with 1 : 3000 perchloride solution,and perhaps the local application of ; : 10 silver nitrate solution,or 1 : 20 sublimate, or 1 : 10 iodoform collodion.

ADENOPATHY.

Syphilitic adenitis and lymphangitis usually calls for nospecial treatment;such lesions generally subside spontaneously soon after the disappearance of the induration of the chancre,though the enlargement of the lymphatic glands may persist for five or sixmonths, or in exceptional instances for many years.The administration of mercury,when the diagnosis has become so certain that its use is justifiable,causes a rapid disappearance of the disease.The arylarsonates should be tried also.Bubo will call for the usual antiphlogistic measures,and suppuration will require the ordinary surgical procedures.

CONDYLOMATA.

The usual specific treatment withmercury and the arylarsonates generally causes the disappearance of these in a few weeks - in the absence of retarding irritation,of course.The strictest cleanliness must in all cases be observed.The lesion should be washed thoroughly with one or other of the above-mentioned antiseptics,dried,and the part burnt;then calomel should be applied.Silver nitrate and subsequent dusting with iodoform will be called for in cases of exuberant growth. A recently-introduced preparation is iodoricinolate, which is said to give satisfactory results in these cases.

SYPHILODERMATA.

In addition to the general constitutional treatment as already described,syphilides call for the topical application of mercury and the use of hot baths. No local applications are needed in the case of erythematous syphilodermata arising;but when these and other forms of syphilitic eruptions are troublesome fumigation and various baths do good.If mercury is being administered by inunction,the sites of the syphilide should be chosen for the rubbings.Crusts and small ulcers may be softened by the use of ordinary hot baths. Ammoniated mercury is a good local application,and the same is true of calomel cream.Syphilitic psoriasis is not infrequently very intractable,and calls for the application of ichthyol and cola-tar preparations for its relief.Papular syphilides are sometimes also very stubborn,but usually do well on vapour baths,inunction

with massage,and ointments of the nitrate or the ammoniate of mercury.Papulo-squamous forms generally yield readily to such topical applications.When these eruptions attack the hand,in which locality they may be persistently recurrent,the local vapour bath is particularly efficacious.The interior of an inverted hat-box is filled with calomel vapour by means of a small alcohol lamp placed beneath a metal dish containing calomel,and the hand is introduced through a hole cut in the side of the apparatus.The hygiene of the mouth should be carefully attended to lest mucous patches form.When they do occur, they should be painted twice or thrice daily with a one to ten per cent.solution of silver nitrate,or touched with the solid stick,and an antiseptic mouth-wash should be used - e.g.,boracic and tannic acid with honey and water.Sprays of peroxide of hydrogen are not infrequently useful,and the same is true of a perchloride wash.The lesions may be stimulated into healing by the application of tincture of iodine.Scaly patches should be touched every second or third day with a ten per cent. chromic acid solution or acid mercuric nitrate half strength.Should they still persist,they should be removed with the actual cautery or a sharp spoon.Ulcerated mucous patches in the throat are benefited by the same treatment,the lotions being used as gargles.Fumigations may also be tried;for this purpose Mauriac recommends twenty-five minutes of fumigation with fifteen grains of cinnabar and eight grains of the green iodide of mercury,or the inhalation night andmorning of the vapour from a burnt lozenge composed of a half-drachm of the green iodide of mercury,carbo lig.,one ounce and a half,eight grains of benzoin,and a sufficiency of water. The patient must be warned against smoking and all other uncleanliness of the mouth.Vegetating and exuberant condylomata should be cauterised with nitric acid,acid mercuric nitrate,or chromic acid - which latter, however,must not be applied to a large surface,as death has been known to occur from this.The vegetations may also be destroyed by caustics;one application of some such agent as caustic potash is usually enough,but may in some cases require repetition at intervals of two or three days,followed by iodoform dusting,which in from three to ten days promotes scar-formation.Thirty grains each of salicylic acid and extract of cannabis indica in an ounce of flexible collodion will make a good application;but usually mild cases,beyond cleanliness and drying and dusting with calomel,call for no local treatment.Extensive papillary growths require removal by excision,the resulting raw surface being,if necessary, skin-grafted.Mercurial and vapour baths,supplemented by calomel and zince ointment,are of especial service in cases of pustular and pustulo-crustaceous syphilides. The calomel and zince ointment maybe applied to the patient's face on retiring for the night.Indurated and crusted ulcerations usually do well under the application of a ointment composed of perchloride of mercury (gr.ii.)nitrate of mercury ointment and carbolated vaseline(of each 3iv.);or two drachms of the red oxide of mercury and be mixed with three times that amount of zince ointment and then applied.Should leg ulcers refuse to heal under cleansing,strapping and bandaging,the whole surface and the surrounding skin may be covered in with a piece of thinly-spread plaster containing equal

parts of emplastrum hydrargyri and emplastrum cerati;over this is applied a tight bandage which includes the foot and leg.The quantity of the discharge will determine the amount of the dressing to be applied.The application,of lint,of an ointment composed of the compound iodine unguent,and the ointments of belladonna and mercury,with carbolated petroleum,in the respective proportions of one drachm,two drachms,three drachms,and four drachms, is very suitable for non-ulcerated tubercular syphilides,gummata,and periosteal nodes;it may be assisted in its action by the local application of heat,a hot-water bag being applied during the day or according to indications. Boisseau(Med.Annual,1908,p.556)recommends the injection of a three per cent.solution of potassium iodide into the cellular tissue surrounding subcutaneous gummata;for the purpose of rendering the medicament painless,he adds some guaiacyl calcium to the solution,which he advises also for the treatment of obstinate syphilodermata.Besnier and Crocker(ibid.,1908)inject the iodide into the gummata;those under the skin should never be incised,they say.Tertiary ulcerative processes should be combated by the local application of calomel powder,or with an ointment made with iodine and iodide of potassium having a basis of lanoline;calcium iodide usually causes rapid healing in syphilitic ulcers of the leg.Chronic and persistent serpiginous ulcers should be treated by the prolonged bath:days or weeks if necessary;failing healing in this way,the actual cautery may be used.Ordinary ulcers may be treated on general principles,or curetted, cleaned and aseptisised.Some of the reported cases of obstinate ulcerating syphilitic lesions which resisted antisyphilitic treatment recovered promptly after an attack of erysipelas;such form of treatment has,however, not yet been adopted as a routine measure.Phagedena requires the use of iodoform and strict antiseptic rules. Robinson(Med.Rec.,June,1907),in cases of obstinate syphilodermata which resist mercury,gives an eighth of a grain of pilocarpine daily on three or four occasions.

ALOPECIA.

The treatment of syphilitic baldness is largely constitutional.The hair should be cut short and well washed with soap and water every night;then mercurial ointment may be rubbed in or a stimulating lotion of cantharides.Apart from this,the local treatment is cleanliness and protection.

ONYCHIA and PARONYCHIA.

Onychia calls for the usual constitutional measures;the part should also be kept clean and duly protected.The local treatment must be conducted on general surgical lines.Prolonged immersion in weak,hot perchloride solution, 1 : 2000, followed by the application of moist compresses wrung out of the same solution and kept from drying by the application of oiled silk,will keep the ulcerating surface clean and ultimately end in cure.When the granulations are indolent and exuberant,forming a mushroom-like growth,they may be thoroughly curetted,or their surface may be sprinkled with dry powdered nitrate of lead,an ordinary gauze dressing being applied over this.When ulceration has undermined the nail,the latter should be trimmed away sufficiently to allow thorough local treatment to be applied to the whole of the diseased surface.Iodoform and aristol are both useful applications,but only when

they are brought in direct contact with the ulcerated part.When cicatrisation has occurred,the formation of a satisfactory nail may be effected by the daily strapping with thin strips of adhesive plaster.It is desirable that the patient should wear a finger-stall all through.

MOUTH.

All lesions of the mouth should be kept as free from irritation as possible.The patients,in order to avoid endless relapses,should not smoke,chew tobacco,or take snuff.The mucous membrane of the part should be kept free from particles of food by rinsing the mouth at frequent intervals.Mucous patches and ulcers should be cauterised.Chromic acid,nitrate of silver,acid nitrate of mercury,or chloride of zinc may be used - the first-mentioned in the strength of from fifteen to thirty grains to the ounce,the second as a ten per cent.solution,and the third in a solution of five per cent.Tincture of iodine or hydrogen peroxide are preferred by some.The patient must take no alcohol,and on no account should he kiss children or others.Borax,potassium chlorate,alum, black wash,or chlorine-water make good gargles in these cases.The dietary must be duly arranged and all hygienic rules observed.Leucoplakia calls for the above treatment also,but caustics must be carefully applied.Calomel may be administered subcutaneously,and sometimes acts remarkably well;the same is true of the arylarsonates and other specific drugs.The internal administration of chlorate of potash with the iodide is not infrequently very serviceable.

NOSE.

The use of the douche is advisable for the removal of dust and other irritating particles;on no account must the patient indulge in the snuffing habit. Nasal discharges and crusts should be removed by irrigation or swabs;packing the nose with gauze checks the formation of scabs and keeps the part clean.The application of antiseptics by means of sprays is very useful, especially when ulceration is present.Potassium chlorate, sodium chloride,hydrogen peroxide,potassium carbonate, or mercurial solutions make the best sprays and irrigations.The insufflation of iodoform or the application of nitrate of silver may be required for the cure of ulcers. Hygiene is in all cases most important.In rare instances the osseous lesions are premature,that is,they complicate secondary syphilis;mercury should then be combined with the iodides.When these lesions are distinctly gummatous in type,-and under such circumstances they are nearly always late tertiaries,-the iodides form the basis of treatment,supplemented by mercury,administered preferably by inunctions.When dead bone is found it should be removed.This is accomplished under an anaesthetic by means of the finger and a curette.Bleeding is often profuse,but is readily controlled by packing.Following this the whole nasal cavity must be cleaned every two hours with sprays,the first containing hydrogen peroxide twenty-five per cent.,the second dilute solutions of thymol or other disinfectants and antiseptics.Insufflations of iodoform and iodol may be useful after the cleansing spray.When a small portion of bone is necrotic,it is advisable to wait for its loosening prior to removing it,the internal treatment of the disease being persevered with meanwhile.Various plastic operations have been devised for the cure of the hideous deformities

which sometimes result from syphilis of the nose;they are all described in the surgical text-books and need not be detailed here.

PHARYNX.

Cases of pharyngeal syphilis usually do well under local treatment such as above outlined.Ulcers should be very carefully treated;otherwise serious damage may be done.All strong caustic must be avoided,and topical applications of calomel or iodoform made.An obturater must be fitted when perforation of the palate occurs after failure of caustics and other medicaments on general lines.Porter(Lancet,Jan.26,1901)says that in all forms of tertiary syphilis of the pharynx the combination of iodide of potassium internally and mercurial inunction is especially useful,and should be employed at the earliest possible date.In tertiary ulceration local treatment goes a long way towards curing the disease. The surface of the ulcer he carefully cleans and insufflates with iodoform,or in some cases with heated calomel. In cases in which there is much pain he has seen the insufflation of orthoform attended with results most grateful to the patient,one insufflation not infrequently relieving pain for as long as twenty-four hours.He is in favour of both chromic acid and nitrate of silver,the best method of applying either of them being to fuse a little of the pure drug on to a probe,and,having cleansed the surface of the ulcer,to paint it on.For the relief of the pain and the cleansing of the throat the patient is prescribed for home use a gargle composed of ten grains of chlorate of potash,half an ounce of black wash,and water to one ounce.For the treatment of adhesions he thinks that the less the operative interference, the better the chance of cure,it being never wise to operate unless there are very strong reasons for trying to relieve the obstruction,such as rapidly increasing deafness,constant and intense earache,or general discomfort from stenosis of the nose.Should operation be considered absolutely necessary,every conceivable device will have to be tried for maintaining a larger opening. From observation on a large number of cases he considers it surprising how great an amount of contraction may exist with comparatively little discomfort.He adds that when the opening is so small as to cause symptoms,it is generally sufficient to pass dilating instruments regularly and in increasing sizes in order to render the patient quite comfortable,and this the patient can easily be taught to do for himself.

LARYNX.

Cases of laryngeal syphilis call for vigorous constitutional treatment of the usual sort.In addition to this,much benefit may be derived from the inhalation of tannic acid,alum,or a spray of corrosive sublimate;and occasionally the cicatrisation of ulcers and the resolution of large infiltrations may be accomplished in this way.In obstinate cases preparations which stimulate absorption or cauterise may be directly applied to the parts with the aid of the mirror.Grossmann,who is a great exponent of local treatment,uses the galvanocautery,under cocaine anaesthesia,nearly exclusively whenever he finds an indication for cauterisation in laryngeal syphilis. According to him,the result may be compared with that of any of the older methods of treatment by caustics. He cauterises only ulcers and severe and obstinate

infiltrations which will not respond to any other treatment. In all other forms of nasal or laryngeal syphilis, and in the case of ulceration also in the intervals of cauterisation, he says that he has for a number of years exclusively employed oleum cinereum. The results of this method of treatment, which, of course, was conjoined with constitutional treatment, as the most important part, were very pleasing. Our author says, indeed, that he knows no remedy which will more favourably influence the local syphilitic process in the larynx, the nose, and the pharyngeal cavity than oleum cinereum. In a short time, often after a few days, the subjective symptoms, as the troublesome sense of dryness, the irritation producing cough, the difficulties of swallowing, the pain, etc., begin to improve. The objective symptoms subside somewhat later, and the disappearance of the infiltration, the clearing up of the ulcers, and the diminution of the swelling may be observed even when the formation of a perichondritis would naturally be expected from the severity of the local disease. Much benefit is not infrequently derived from the external application to the laryngeal region of tincture of iodine, mercurial plaster, and the subcutaneous injection of gray oil. During the gummatous stage of laryngitis the lesion should be touched daily with a solution composed of one part of iodine, ten parts of iodide of potassium, and one hundred parts of glycerine, it having been previously sprayed and treated with one in the thousand perchloride. Following this the part may be dusted with iodol or some similar preparation. Any stenosis of the larynx resulting from cicatrices must be overcome by gradual dilatation. Oedema of the larynx occurs now and then, and requires free scarification or tracheotomy or laryngotomy.

ALIMENTARY TRACT.

Mouth.

Syphilis of the mouth calls for the usual constitutional treatment. Locally, for well-developed ulcers only antiseptics and perhaps caustics may be employed; when seated on the lips the application of mercurial plaster may also be considered, and has been advised by various authorities. Special attention must be given to the danger of transmission to other persons by the common use of eating-or drinking-vessels, kissing, etc. The patient should always be warned of this danger, and the necessary prophylactic rules should be firmly impressed upon him.

Oesophagus.

Oesophageal syphilis is, of course, treated constitutionally. Strictures require mechanical dilatation, just as other forms of stricture do.

Stomach.

Gastric syphilis being an expression of the constitutional disease must be treated accordingly. Rest in bed is important, and the diet and other factors of a cure must be duly arranged on general principles.

Intestines.

The same general rules governing the treatment of gastric syphilis must apply here also. In the case of the rectum, in addition to the general specific medication, the ulcerating surfaces must be treated carefully. When the ulcerations are slight and superficial, regulation of the bowels and cleansing

injections,repeated night and morning,may be sufficient. Suppositories of gray oil and enemata of weak boric acid are useful.Deep ulcers may require stretching of the sphincter,followed by many weeks of rest in bed,with daily topical applications suited to the condition of the granulating surface.Incision of the sphincter is often curative.Rectal strictures can only be benefited by dilatation or operation.The former is effected graduated bougies specially devised for the method;or the stenotic part may be divided and then dilated.Failing all this,inguinal colotomy must be performed and the stenosed part of the gut removed and the usual suturing done.

LIVER.

Syphilitic hepatitis occurring in the secondary stage of the disease must be treated with mercury ar the arylarsonates.Liver troubles are,however,usually observed as late tertiary manifestations;and in these cases the iodide of potassium should be administered in large doses,beginning with thirty grains a day and running up by five grains a day will the symptoms yield or iodism is produced.As much as two or three drachms is not infrequently taken daily by the patients.Inunctions of mercury should also be used at intervals;and all through due attention should be given to the advantages of tonics,massage,bathing,exercise,and general hygiene. Few cases of amyloid syphilitic degeneration of the liver recover.The treatment is that suitable for late syphilis,combined with tonics,stimulants,suitable diet, and general hygienic rules.

SPLEEN.

In the case of recent syphilitic enlargements of the spleen constitutional treatment may effect much in reducing the tumour;and the facility with which its reduction is effected will afford a valuable indication of the success of treatment.Gummy tumours are probably within the reach of antisyphilitic treatment,and it is not unlikely that some of the shrunken,indurated areas often detected post-mortem,and usually ascribed to infarctions,are in reality due to cicatricial remains of old gummata.Treatment has but little effect on chronic diffuse splenic enlargements of syphilitic origin.

PANCREAS.

Pancreatic syphilis not being manifested by characteristic symptoms during life,is not usually specially treated.When suspected,the usual antisyphilitic remedies should be pushed and symptomatic measures also employed.

KIDNEYS.

In addition to constitutional treatment,the nephritis condition shouldbe managed in the usual way, the patient being kept in bed,dieted,and sweated,and due attention paid to the promotion of the action of the bowels.In secondary syphilitic nephritis,when there is no destructive lesion,the rules for such an acute lesion must be strictly observed,in order that the disease may not become chronic.Tertiary renal affections call for the same treatment as chronic Bright's disease.Mercury should be administered with great care;on account of the crippled condition of the kidneys it is very apt to produce toxic symptoms.Iodide of potassium,in full doses,is the drug on which one must rely mostly.No strict attention ot diet is

absolutely necessary,the patient being allowed to have more or less what he fancies of the wholesome,unirritating foods.The amount of urea shouldbe frequently estimated,as a marked fall in this urinary constituents means that the drug must be abandoned.The injection method is perhaps the best form for the administration of mercury in this disease.

URETERS and BLADDER.

Syphilis of these parts,if suspected,should be treated on the general principles already outlined, with due attention to the symptomatic indications.

TESTICLE.

A syphilitic testicle should be treated with Scott's dressing and elevated.Constitutional measures usually effect a cure without pther local treatment.Tertiary affections call for iodides.

PENIS.

The treatment of the primary lesion has already been described.Tertiary affections call for the exhibition of the iodides in full doses.

OVARIES,UTERUS,VAGINA,and VULVA.

The usual constitutional treatment should be employed for syphilitic lesions of these parts,meeting also symptomatic indications in the usual way.

MAMMARY GLAND.

Syphilitic affections of the breast usually yield promptly to specific medication;and the therapeutic test is the main one on which a differential diagnosis can be made.

NERVOUS SYSTEM.

Syphilitic affections of the brain in themselves are usually curable,but the secondary results are seldom so.Thus,we can cure a gumma,but not a sclerosis resulting therefrom;none of the antisyphilitic medicaments can remove a patch of sclerosis,restore a softened area of the brain,or restore function to a thrombosed vessel.To give satisfactory results,treatment must be commenced early;but,unfortunately,this is mot always possible,as the disease is often too far advanced before advice is sought.The premonitery symptoms are distinctive,and if properly appreciated and acted upon,brain syphilis would be less common than it is,the actual development of these dangerous lesions being prevented thereby.In most of the cases in which death occurs in properly-treated brain syphilis the fatal result is produced by exacerbation,or accident as it may be termed, of the disease.In these circumstances the treatment should be that which is adapted to the relief of the same acute affection when dependent upon other than specific cause.In a large proportion of cases the acute outbreak takes the form either of a meningitis or else of a brain congestion.In either instance when the symptoms are severe,bleeding may be tried.The amount of blood taken is, of course,to be proportionate to the severity of the symptoms and the strength of the patient.Life is sometimes saved by by the letting of a quart of blood,while in other cases a few ounces suffice.Care must be,of course,taken not to mistake a simple epileptic fit for a severe cerebral attack;but when this fit has been preceded by severe headache and is accompanied by stupour, with marked disturbance of the respiration,measures for immediate relief are usually required;and of the convulsions be perpetually repeated or if there be violent

delirious excitement,the symptoms may be regarded as very urgent.In taking blood the orifice should be large,so as to favour a rapid flow,and the bleeding be continued until a distinct impression is made upon the pulse. In some cases in which,after the blood had been taken to the limit of safety,the action of the heart continues to be violent,good results may be obtained by the hypodermic injection of three minims of the tincture of aconite every half-hour until the reduction of the pulse and the free sweating indicate that the system is coming under the influence of the heart sedative in question.In these cases,of course,it is not intended that the operation of venesection should be too freely or improperly performed;but in some of the fatal cases that occur one almost invariably regrets that blood had not been taken at once very freely at the beginning of the acute attack. After blood-letting,or in feeble cases as a substitute for it,the usual measures of relief in cerebral congestion should be instituted.In convulsive types the bromides are useful;antipyrine,chloral,and chloralamide, etc,,are at times of greatest service when the pains are intense.Electricity should be employed to stimulate the paralysed muscles.In short the symptomatic measures which obtain in non-specific cases should be employed. The great thing in brain syphilis is to see that the antisyphilitic measures be instituted promptly;and mercury and iodide of potassium are the drugs upon which the greatest reliance must be placed.In selecting between them it must be borne in mind that even a very small amount of syphilitic deposit in the brain may at any time cause a sudden congestion or other acute attack,and is therefore a very dangerous lesion.Thus,one reads about cases of cerebral syphilis which were manifested only by an epileptic attack occurring once in many months,and in which after death the affected membrane was found to be not larger than a shilling,and the deposit not more than an eighth of an inch in thickness - the same suddenly producing a rapidly fatal congestion;and one sometimes sees a case fast progressing towards recovery suddenly end by the too long continuance of the arrest of respiration during an epileptic fit.There are not a few observers who say that they have no doubt of the superiority of the mercurials over the iodide of potassium as a means of producing absorption of gummatous exudates in these cases;and as these exudates in the brain are so very dangerous,a mercurial course should in the majority of cases of cerebral syphilis be instituted as soon as the patient comes under observation. When,however,there is a history of a recent prolonged use of the mercurial,or when there is marked syphilitic cachexia,the iodide should be chosen.Cachexia is,however,a distinctly rare condition in brain syphilis,the disease usually developing in those who have long had apparent immunity from the constitutional disorder.Some writers hold that the best preparation of the mercurial for internal use in these cases is calomel,which should be given in small doses,a quarter of a grain every two hours,guarded with opium and astringents,so as to prevent as far as possible disturbance of the bowels - it being continued until soreness of the teeth, sponginess of the gums,or other evidences of commencing ptyalism are induced.After this the dose of the mercurial should be reduced so as simply to maintain the slight

impression which has been created,and the patient should be kept under the action of the drug for several weeks. The inunction method is a very effective one,and where the surroundings of the patient are suitable the mercurial ointment may be substituted for the calomel. It should be applied regularly,according to the method already outlined.It is sometimes of great advantage to combine large doses of iodide of potassium with the mercurial inunction.The iodide should always be exhibited freely after the mercurial course,the object being not to overcome the natural disease only,but also to bring about the complete elimination of the mercury from the system.There is no use in giving the iodide in small doses;at least a drachm and a half should be administered in the twenty-four hours,and it is sometimes advisable to increase this to three drachms until evidences of iodism are observed.The compound syrup of sarsparilla covers the disagreeable taste of the iodide of potassium better than any other substance of which I have knowledge.Zittmann's decoction,made according to the formula already given,may be occasionally used with very excellent effect.Hygienic measures are of importance, the nervous system must be kept at rest,worries should be removed,and the patient should have moderate and regular exercise.The mercury may be injected intramuscularly,and the arylarsonates may be tried,as may also hydrotherapeutic measures.Parasyphilitic and other affections of the nervous system must be treated on general principles with due regard to the value of the specific plans.

EYE.

Constitutional treatment must be instituted in all cases of ocular syphilis and the well-known topical measures instituted in the case of each.The treatment of syphilitic iritis consists in the free application of atropine drops,four grains to the ounce,hot compresses and leeching the temples to relieve pain and enhance the action of the atropine,and the persistent use of such antisyphilitic remedies as are indicated by the stage at which the inflammation of the iris commenced.In obstinate cases,and especially in gummatous iritis,subconjunctival injections of corrosive sublimate may be used with benefit.Success depends upon beginning the treatment early enough to tear loose the synechiae by the use of atropine,which,except in cases of serous iritis where there is a tendency to rise of intraocular tension,must be vigorously used until a perfectly round pupil is obtained and all signs of irritation have passed away.Should there be increased intraocular tension,eserine must replace the atropine.Photophobia is relieved by smoked glasses or a well-ventilated,darkened room. Sometimes atropine increases the conjunctivitis;in these cases hyoscyamine or duboisine may be employed instead. The treatment for syphilitic cyclitis does not differ from that of iritis.In choroiditis and retinitis energetic measures are required.Atropine drops,leeches to the temples,warm compresses to the eye,and protection of the eyes are indicated.Jaborandi,fifteen minims of the liquid extract,and pilocarpine nitrate,a twelfth to a sixth of a grain,are indicated,as well as rest in bed. After the sweating induced by these drugs the patient should have a warm bath and be carefully treated during the convaleseence for any complications that may arise.

Antisyphilitic measures are of great service, when early instituted, in cases of optic neuritis; but none of them can cure optic atrophy once it has occurred. Other optular lesions require the specific drugs and the standard local medication.

EAR.

Mercurial injections and the arylarsonates are of great service in the treatment of aural syphilis; a perfect cure may not be effected, but the deafness is not infrequently considerably relieved. Pilocarpine is useful to promote beneficial diaphoresis, especially in cases in which mercury and the iodides have failed or are feeble against the disease. When the external auditory meatus is involved the treatment should comprise thorough cleansing, the use of astringents, and the application of cauterants to the ulcerated spots. Extensive overgrowths and polypi should be snared or curetted away, dusting powders being also applied. The passage must be kept wellopen, as there is a risk of stenosis or occlusion of the meatus arising from ulcerative processes. When the labyrinth is invaded the specific treatment should be pushed to the utmost that the patient can tolerate. Total deafness is almost inevitable in these cases.

LUNGS.

Bronchial lesions are usually associated with pulmonary syphilis and call for the same treatment. The treatment of syphilis of the lungs is, apart from the usual antisyphilitic regimen, purely symptomatic. Large doses of iodide of potassium or sodium with tonics will oftenclear up the lung and the diagnosis at the same time. For this purpose large doses of the iodide with injections of the arylarsonates will prove most serviceable. At the same time the syrup of the iodide of iron, or quinine or strychnine preparations, may be administered three times a day, together with the most nutritious food available. Much can be done to cure these cases with specific remedies, ferruginous tonics, and aonstructive nourishment. In the main, the general principles of treatment correspond with those recognised in similar forms of non-specific etiology; the ravages of syphilis, however, not infrequently produce such loss of substance in the lung that the lesions are irreparable, and therefore we cannot always accomplish the brilliant results which usually attend an antisyphilitic medication.

BONES.

Bones syphilis calls for the exhibition of potassium iodide forthwith on its occurrence, large doses being used in the presence of failure with small ones. Broken-down gummata should never be incised, except as a last resort, as incision delays resolution. No drug can remove a sclerosed bone, which can only be done by a surgical operation. Symptomatic treatment is also to be employed according to indications.

JOINTS.

The main indication in syphilitic articular disease is the administration of mercury and iodide of potassium, except in the forms occurring in the beginning of the secondary period, when mercury or the arylarsonates alone should be given. The local treatment is the same as applicable in other forms of non-suppurative arthritis, rest and pressure procured by splints and bandages, counterirritation being demanded. Warm baths relieve the pain considerably, and Scott's dressing is

of service.Synovitis calls for mercury,etc.,and carefully applied subsequent massage.The iodides and Scott's dressing cause a marked improvement in cases of gummatous processes in the synovial membrane;but it must be borne in mind that there are instances which resist all forms of treatment.

MUSCLES.

Syphilitic affections of the muscles respond readily to constitutional treatment in conjunction with symptomatic applications according to indications of the stage arising. TENOSYNOVITIS is treated on similar lines.

HEART.

The treatment of cardiac syphilis comprises the administration of mercury and the iodides.The former drug furnishes the best results,perhaps,by inunction in these cases,and every patient affected with heart syphilis should be put at onceon the inunction cure.In fact,the mere suspicion of syphilis justifies the treatment.The medication may be interrupted from time to time,after the lapse,for instance,of several weeks or months,and substituted from time to time by the iodide of potassium or sodium,which may be given in doses of five to fifteen grains three times a day,best largely diluted with milk or water.The iodine treatment should itself be suspended in the course of several weeks and the mercurial inunctions resumed.The arylarsonates are also worth a trial in these cases.Signs of heart failure must be combated bythe usual means,especially by rest in bed,the exhibition of digitalis,iron,quinine, strychnine,and other tonics.The bowels must be carefully regulated in the usual way,the diet must be carefully regulated,but alcohol should be avoided in most instances,as it throws too much strain upon the already weakened heart.A complication with angina pectoris calls for the administration of the nitrites and nitroglycerine, together with the other therapeutic adjuvants of that disease.

HEREDITARY SYPHILIS.

PROPHYLAXIS.

The prophylactic treatment,or that directed to the health and sexual relations of the parents previous to conception has already been described,and is that appropriate to syphilis,except that more attention is paid to the general sexual hygiene,and all possible is done to oust the constitutional taint by full doses of mercury.One of the most important practical points in the prevention of congenital syphilis is attention to the marriage question,which is always a vexed one;or,that of the prevention of conception should matrimony already have taken place.Present-day opinion seems inclined to the view that the oft-vaunted theory,that a syphilitic may be allowed to marry two and a half years after infection,is dangerous;for,though it is true that a large proportion of syphilitics who marry within these limits have healthy children,there is a minority who transmit the disease and who infect their wives.Generally speaking,the earliest period at which marriage should take place is four years;and the patient must take the

consequences if he enters wedlock before this.Should a married person contract syphilis after marriage,conception should not occur until the lapse of the above-mentioned period.This rule broken by intercourse being indulged in,antisyphilitic treatment must be resorted to in the case of the husband or wife,according to the one who is contaminated. The treatment of the mother during pregnancy,after having conceived from a syphilitic husband,or having had antecedent syphilis,is simply that of acquired syphilis in either adult or child.Mercury is the drug indicated,and in its full physiological doses. It may not be amiss to combine it with iodide of potassium in moderate doses;but the practice of employing the latter to the exclusion of the former is both theoretically and clinically unsound.Care should especially be taken to give it in such manner,either by inunction or fumigation or so guarded with opium,that it will not produce any irritation of the bowels,the sympathy between which and the uterus may,in the event of a strong purgative action being set up,lead to an abortion.When the mother is carefully treated in this way,she will probably have a living child,which will either have a mild form of the disease or be quite healthy.

GENERAL TREATMENT.

The treatment of congenital syphilis is carried out on the same lines as in the acquired disease,as the pathology,stages,and general course of the two affections are alike.But in hereditary syphilis there are two elements which should modify the treatment somewhat, and must be taken into consideration.These are,first, the existence of a more or less profound cachexia influencing all the nutritive and formative processes,and in itself,entirely apart from any definite specific involvement of vital organs,threatening life;and second, the not infrequent occurrence during the secondary period of symptoms,notably gummata,belonging to the tertiary stage of the disease.The cachexia and its results are combated by making the treatment from first to last not only antisyphilitic,but also supporting or even stimulating;and with this object in view special attention should be paid to the nutrition of the infant.In all cases the nutrition of the syphilitic child is of the utmost importance.It has a peculiar liability to digestive troubles:yet it is extremely desirable that it should be properly nursed;and with the strong probability that it will infect a healthy nurse,the duty of suckling her infant devolves most strongly upon the mother.Even if the mother is manifestly syphilitic,in the majority of cases she will be yet capable of nursing her infant.If her disease is severe her milk may not be of the best quality and may be deficient in quantity;but even under such circumstances it is usually better for the child to have its mother's breast as far as possible,the deficiency being made up by feeding it artificially as many times a day as may be required,the mother receiving the usual treatment for her disease.According to Vernois and Becquerel's analysis(On Woman's Milk,Paris,1853)of the milk of nine syphilitic women,the water and salts are increased while the casein and butter are diminished. Although the quality of such milk is indeed poor,it is better that the child should be suckled as far as possible on it than that artificial feeding should be entirely relied upon.Moreover,it is probable that where the

disease is of a milder character than in the cases which these two writers analysed the milk is not much inferior to the normal.But when the mother is apparently healthy and her child syphilitic she should still suckle it,as there is risk of her constracting the disease;this is in accordance with the wellknown law already discussed. It is a heinous misdeed to give a syphilitic child to a healthy woman to nurse;for it is almost sure to infect her,and she in turn may give syphilis to her own baby, if she is still nursing it,and to other members of the family.The question sometimes arises whether one may allow the employment of a healthy nurse for a syphilitic child if the nurse herself knows the danger to which she is exposed and is willing to take the risk of contracting the disease,which with a probability amounting to a certainty she will do.Indeed,there are cases in which the parents are ready to do anything to raise the child, and where the nurse from some motive,pecuniary or otherwise,is willing to brave all dangerCases of this sort present special features which must influence the practitioner in his action;but in giveing even a half-sanction to such a sacrifice on the part of the nurse he must make sure that she knows the risk she is running;for he alone can understand the possible future such a sacrifice may entail,and he must be in some measure the guardian of the woman and of the public.He should make sure that the compensation the nurse receives is in proportion to the risk run.He should take care that the nurse's husband and children,and through them the community,are protected.If after all the nurse accepts the care of the syphilitic infant,pains must be taken to avoid inoculation. The infant should be properly medicated in accordance with the accepted teaching of the day.The best protection of the nurse is the use of an artificial nipple.Women who have had syphilis and recovered are not exposed to infection,and if a wet-nurse who answers that description can be found,she is the one to suckle the syphilitic nursling;one may also employ a woman who has borne syphilitic children and remained free from the disease. If the child cannot be fed at the breast,its chances for survival are greatly reduced.Many of these cases have,it is well known,to be reared by hand on the bottle,which method is conducted on general principles obtaining in non-syphilitic conditions.

The routine medicinal treatment of the disease does not materially differ from that of the acquired affection.The same drugs exercise like powers in both varieties of syphilis,appropriate doses and preparations being,of course,duly taken into consideration.Forthwith on the manifestation of syphilitic symptoms the infant must be put on mercury.It is the drug of drugs,and these young patients bear it remarkably well.When an apparently healthy child is born of syphilitic parents, the therapeutic indications are not so clear,since there is no certainty that the disease will ever make its appearance.In general,it is best to wait for the characteristic symptoms when the parental syphilis is paternal,or is old,or when during the whole course of gestation the mother has received vigorous antisyphilitic medication.When parental syphilis is maternal,is recent, and particularly when it has not been suitably treated, it is better not to wait for the syphilitic symptoms but to institute the mercurial medication without

delay.In doubtful cases the medication should be postponed until the appearance of constitutional phenomena. The first of these is alteration in the blood:hence repeated comparative studies should be made of this liquid,and the diagnosis of the disease can be taken as established sufficiently for the commencement of the specific treatment when there is found an otherwise inexplicable diminution of the haemoglobin and an increase of the leucocytes.

One of the best way of treating congenital syphilitic infants is to practise the inunction with mercurial ointment diluted with an equal or three parts of vaseline. With this ointment a piece of cloth large enough to cover in great measure the child's belly(after this has been washed with soap and water,disinfected and dried)is thickly spread and placed under the flannel binder.It is renewed daily,and its position may be shifted from front to back or side as often as any signs of irritation are observed,or regularly so as to anticipate this complication.The movements of the child serve to keep up a slight friction,which is sufficient to introduce the mercurial into the system.The binder may be changed every fourth day,and after it has been worn twenty-four hours it is a good plan to again wash and disinfect the belly and rub a half-drachm of the unguent into the skin and then fix on the binder again.The application of the ointment to the abdomen without the binder is not such a satisfactory plan.Dermatitis is an annoying complication sometimes occurring in these cases;the skin should be bathed with witchhazel and dusted with oxide of zinc, or other healing powder,the mercury being then administered in the form of inunctions,which are then rubbed into the back,sides and front of the chest,and the arms,thighs and legs,each day a new area being selected for the application.In certain instances the subcutaneous irritation is so severe from the use of inunctions that they have to be abandoned altogether;fortunately the experience is uncommon.

Advantage is sometimes derived fromthe use of baths of perchloride of mercury,but such a method is admittedly inferior to inunction.

The most efficient drugwhen oral therapy is resorted to is gray powder or hydrargyrum cum creta.Of this half a grain,or even a grain,may be given night and morning,the dose being increased by a fraction of a grain every few days until the child is taking two grains twice a day.To prevent any irritating effect upon the bowels,it is advisable to add a grain of potassium carbonate or a few grains of prepared chalk to each dose. When gastrointestinal troubles result from this form of medication,inunction or some some other method must be tried. Calomel is also largely used by certain writers, particularly by Jacobi.It is sometimes effectual in calming irritability of the stomach when excited by other forms of mercury,or when it exists from independent causes.It may be given in doses of a twentieth to a sixth of a grain,three times a day.Its use is sometimes attended with diarrhoea,but it can usually be given for months at a time.If diarrhoea should be excited without fault in the feeding,a twentieth to a twelfth of a grain of Dover's powder may be added to each dose;but usually the addition of an opiate is to be avoided.The perchloride

of mercury in solution is an extremely convenient form for administration,a solution of half a grain in six ounces of water being employed.This solution had no taste,and the child will take it as and like water.It may be given with milk,when its presence will be unsuspected.Of this solution a teaspoonful should be given every three or four hours for prolonged treatment,the interval being shorter when a rapid result is desired. The biniodide of mercury may also be employed if preferred.A useful mixture would be one composed of a grain of that preparation,four drachms of potassium iodide,and three ounces each of the compound syrup of sarsparilla and water.Of this medicine a child one month old may take five drops thrice daily,the dose being increased by a drop every five days.To a patient over five years of age a half a teaspoonful may be given,the dose being gradually increased to one or one and a half teaspoonfuls.At the same time mercurial ointment may be used externally;or,better,an unguent composed of equal parts of blue ointment and a fourth part of balsam of Peru may be kept in contact with the skin by means of a firm binder.

There are certain cases,however,which will not tolerate medicaments orally administered.Here hypodermic injections are indicated.These injections are open to the same objections as obtain against this method in the adult.They are,nevertheless,often to be preferred to internal treatment,and should be administered in the way already considered.The best form of mercury for this method is a one per cent.solution of corrosive sublimate containing twenty per cent.of common salt,as recommended by Finger.Beginning with a dose of one minim,equal to a hundreth of a grain,every second day, the quantity injected is gradually increased to two, three or four times that amount.

The rules governing the administration of iodide of potassium in adults apply also to congenital syphilitic cases;it is of particular value when the bones or the nervous system bear the brunt of the disease.In late cases it is also of signal service.Though the iodides should be given in moderate doses at first,they may be administered in largish amounts in quite young children.Cases have been recorded of congenital syphilis of the liver in which children,not quite two years old,have taken as much as thirty grains of iodide of potassium daily,and with great benefit.It would appear that after three years of age children will bear almost as much as adults,and at all ages tolerate it exceedingly well,provided it be given well diluted with milk or water. Mercury may be given with the iodide,as inthe mixed treatment of adultsThe iodide should always be given in water or in in milk,and the mercurial may be administered by inunction at the same time;or the two may be combined in the same prescription,such as in the above-mentioned biniodide mixture.Iodide of potassium is the best form of iodine to use in these cases, and next to it the sodium salt.The iodide of iron is often used,more as a tonic,however,than anything else.

Besides the medicinal treatment,special attention should be paid to cleanliness and hygiene.The patient should be as much as possible and prudent out of doors, and the best kind of food available should be provided. No matter what form of treatment be adopted,it should

be persevered with long after the disappearance of the syphilitic symptoms,and it is advisable sometimes to continue the mixed treatment till after puberty.

LOCAL TREATMENT.

This is conducted on much the same lines as in the case of adults with the acquired disease.The highly contagious nature of the discharge from the mucous membranes should be borne in mind and all possible done to check it.Of the local lesions the most important is the nasal disease.The accumulation of crusts leading to blocking of the nostrils undoubtedly contributes to the destructive character of the ulcerations.Such crusts should be softened by warm water applied on lint,by camel's-hair brushes,or byspray,and carefully removed. The inside of the nose should then be smeared with some mercurial preparation,such as the white precipitate ointment,or one composed of two to four grains of calomel to a drachm of lard,or even blue ointment diluted with once or twice its weight of vaseline.

When mucous patches are present on the lips,they should be dusted with calomel or smeared with the above-mentioned calomel cream.When located about the genitals or anus,they should also have calomel applied,and be then covered with lint soaked in a dilute solution of common salt.It is sometimes serviceable to treat such patches with nitrate of silver,though comparatively seldom will such drastic measures be required.The constitutional treatmentis the great thing here,though local applications are valuable adjuvants.Ulcers require local dressings with some form of mercurial - than which there is perhaps nothing superior.General surgical principles must in all cases additionally obtain.

CASE + HISTORIES.

Case 1.

This patient was a man of 35 years of age who gave a history of a syphilitic attack of ordinary severity, for which he had been duly medicated. Subsequently there developed repeated epileptic convulsions; but when first seen he suffered from neuralgia also. The spasms, which were clonic and occurred several times a day, sometimes every five minutes, were very violent, and mostly confined to the left facial nerve distribution. The trigeminus was never affected, but in the severer paroxysms the left hypoglossal and spinal accessory nerves were profoundly implicated in all of their branches. Once, fatal asphyxia from recurrent laryngeal spasm of the glottis was apparently averted only by the free inhalation of the nitrite of amyl. The sole other symptom was headache. The patient was given mercurial inunctions externally and iodide of potassium internally. A certain amount of benefit resulted; but this not being quite up to expectations, he was given a full course of Shamin. This was very effective, and treatment was suspended. After a month's rest the nervous phenomena showed a tendency to return, and Orsudan was then tried in full course; then Arsacetin, which, conjoined with iodide of sodium internally, ultimately cured - at least, the man at the last observation was free from all constitutional disturbance and apparently quite well.

Case 2.

This case represents brain syphilis of fatal issue, the symptoms during life exactly simulating those of paralytic dementia. The patient, a middle-aged mechanic, had some years ago suffered from syphilis for which he had been treated for but a short time. Tertiary phenomena appeared in usual course, and these were removed apparently by the iodides. The present illness commenced with an entire change in the disposition of the patient; from being rather reserved, quiet, and very frugal, he became very excited, restless, and desiring continuously to spend his life's savings on useless commodities in the shops. Then failure of memory, marked sense of well-being, carelessness and indifference for the future, developed coincidently with failure of the power of walking, trembling of the hands, inequality of the pupils, and hesitating speech. There was next a period of melancholy, which was in time followed by continuous failure of mental and motor power, and very pronounced delirium of grandeur, ending in complete dementia. Mercury, iodide of potassium, and brain sedatives and tonics, with various symptomatic medicaments were assiduously administered. But the case was too far advanced, and death finally occurred from general paralysis, with progressive increase of the motor symptoms. At the post-mortem examination characteristic syphilitic lesions were found in the skull, dura mater, larynx, liver, intestines, and testicles. The brain presented the macroscopic and microscopic characters of sclerosis and atrophy; the neuroglia was much increased, full of

numerous nuclei,and disintegrated ganglionic cells.The vessels were much diseased,some reduced to cords;their walls were greatly thickened,and full of long spindle cells,and fatty droplets were now and then seen in their interior.

Case 3.

This patient,a clerk in the prime of life,contracted syphilis during an alcoholic debauch.The usual symptoms of the disease appeared and ran their course;and,as treatment was carried out only in a careless sort of way,the affection ran into the tertiary stage.The present illness commenced with a feeling of numbness in the legs,with a small,deep,sharp-cut ulcer on the plantar surface of the great toe;directly after this loss of motion and sensation in the legs and thighs,rapidly becoming complete almost and spreading quickly to the trunk and arms,so that in one week the patient was a helpless,flaccid mass of humanity,and the breathing so interfered with that he cried out aloud that his days or hours were numbered.After almost losing the power of swallowing,he,under the usual antisyphilitic remedies, improved somewhat,and finally so regained power of his hands and feet that he was able to partially dress himself and walk a distance of ten or twelve feet.He continued with the specific medicine,and in time was able to go out.But one day he was caught in a shower,and took a severe chill,which led to an attack of pleurisy with effusion.His temperature rose,and despite all treatment he died.The interest and importance of this case being impressed upon the relatives,a post-mortem examination was allowed.The spinal canal was opened and the meninges of the brain found to be distinctly syphilitic;the neuroglia seemed every where more granular than normal;the ganglionic cells were not distinctly diseased;the white matter was in various places much changed,the tissue appearing abnormally dense and opaque where most affected;the nerve-tubules appeared to gradually lose their myaline,and in places were reduced to simple axis cylinders.Finally,the axis-cylinders became smaller and smaller until in the most altered portions of the cord they disappeared.The autopsy being allowed only for the purpose of the examination of the region in which the disease was located,the other parts of the body were not interfered with.

Case 4.

This patient,a farm labourer of 28 years,had previously suffered from syphilis which was treated in the usual way.The present illness commenced with a feeling of malaise lasting for about a week,followed by sudden, rapidly-developed paralysis of the bladder,loss of power in the legs,and to a less extent in the arms,the only pain being a dull,steady ache in the arms.The bowels were obstinately constipated.Diplopia was soon very pronounced.When first seen,about three weeks after this,there was decided impairment of sensibility in the legs,but not in the arms;marked muscular weakness of both legs and arms;no loss of the power of co-ordination; ptosis of the right eyelid,with diplopia;and only some slight aching pains in the arms.The patient was put on mercury by fumigation,and internally iodide of potassium in full doses.A great improvement was observed,and under the exhibition of atoxyl a complete cure was ultimately effected.

Case 5.

This patient was a middle-aged workman who contracted severe syphilis. For this he was treated for a short time, and shortly before he left off the medication, he fell on his head. Six months before death the headache which had been present ever since the accident became much worse and was most severe in the right supra-orbital region; there were also obstinate vomiting, vertigo, hiccough, and insomnia. There was some loss of power also on the right side. The patient was slow in answering and indisposed to converse. Both discs were choked. He had involuntary evacuations. Mercury, iodide of potassium, the arylarsonates and the usual nervines were tried, and the patient markedly improved. But one day, after an alcoholic debauch he had a relapse. The became quite blind, and complained of an intense thirst which never left him. The specific gravity of the urine was as low as 1003 and 1005. The appetite was at times ravenous. During the last few weeks of his illness the head inclined to the right side, probably from spasm. An autopsy was not allowed.

Case 6.

This patient, a widow of 50 years, suffered also from brain syphilis, and despite all antisyphilitic medication, ultimately died. The symptoms were very interesting and of great severity. There was a series of convulsions, which commenced in either the right foot or in the right face, without, however, loss of consciousness during the attacks. Right-sided hemiplegia was also present, as well as double optic neuritis followed by atrophy. Then the right arm and leg became rigid. Shortly before death the following symptoms suddenly occurred: headache, convulsions of the right side with unconsciousness and retraction of the head, rigidity of the right arm, and tremor of the right leg; the right sterno-cleido-mastoid muscle was stiff, and the patient seemed almost to have opisthotonos; later, both arms went into a position of flexion, with constant tremors of the left arm which spread all over the body.

Case 7.

This patient, a man of 55 years, had syphilis some years ago, for which he was treated in the usual way. Whilst at work he fell, and the following symptoms thereafter appeared, the same perhaps being predisposed to by his alcoholic habits: Headache; vertigo; mental slowness; loss of attention; hysterical manifestations. Nystagmus. Tonic spasms of the neck and forearm. Movements weak and uncertain. Explosive speech. Gradual blindness; choked discs. Conjunctivitis and keratitis of the left eye. Anaesthesia of the conjunctiva. Polyphagia. Constipation alternating with involuntary evacuations and urination. Temperature 97. to 101. F.; head-temperature slightly raised, being highest in the front of the head. The diagnosis was made of cerebral gumma, and the indicated specific and other remedies were employed. Despite all case, the patient died.

Case 8.

This patient suffered from a brain gummatous tumour under much the same circumstances as the foregoing, the secondary and tertiary lesions of the disease being well-marked. A large node was present on the frontal bone, and he suffered from constant headache, which iodide of potassium, etc., failed to relieve. Epileptiform convulsions occurred. There was marked exophthalmos, with impairment of vision in both eyes. The arylarsonates were

tried,and he improved a little.But he became worse again, and the following phenomena were observed:dimness of sight;constant nocturnally-exacerbated pain in the head; and the ophthalmoscope revealed neuroretinitis with commencing atrophy of the optic nerve.The specific and symptomatic remedies were pushed,but they failed to prevent the fatal issue of the case.

Case 9.

This patient,and elderly woman of the working-class,presented a strong syphilitic history.Whilst drunk she had a heated argument with a neighbour,which culminated in her receiving a blow on the head from a domestic utensil.Then the following symptoms were observed.Headache,with agonising paroxysms.Top and right side of the head sensitive to percussion,and headache severest in these regions.Vomiting;vertigo.Great mental irritability. Severe left-sided spasm,beginning in twitchings in the left toes and foot.Partial paralysis of the right leg and arm,most marked in the leg.Hyperaesthesia.Impaired sight.Choked disc.Head-temperature slightly elevated.The usual specific remedies effected a slight improvement at first,but the patient gradually died of exhaustion consequent on an intercurrent pneumonia.

Case 10.

This patient,a man of fifty years,presented a strong syphilitic history and one day fell violently on his head.The symptoms were as follows:vertigo;prickling sensation in the left foot,extending to the thigh,finally to the arm and head,followed by unconsciousness and convulsions followed by stupour.After this,convulsive attacks at intervals.It appears that eighteen months before the present illness he had an apoplectic attack, in which he was unconscious for several hours.Spasmodic attacks,preceded by a peculiar twisting of the fingers of the left hand.Paresis of the right hand and arm.Some diminution of sensation,not well made out.The left leg could not be moved about as usual.The usual specific drugs caused but temporary relief and the patient ultimately died from exhaustion.

Case 11.

This patient was a middle-aged man of no occupation and rather neurotic history.He had suffered from syphilis earlier in life,which ran through its usual stages.The present illness,which he referred to a traumatic cause, commenced with a sudden violent jerking of the middle finger of the right hand,and also of some of the flexor tendons - these symptoms being preceded by a few days' malaise.Twenty minutes after this,he had a fit,in which he became unconscious and beat himself violently on the chest with the right arm.He had three of these fits,and aphasia after this for two weeks.He had high fever at the time of the seizures,and was treated with antipyretics and cold baths.The fingers became paretic,but not the forearm and arm.The arm became numb at times,especially after exertion,and was weaker than the right.The severe headache ceased after some months.The right optic disc was abnormally red,but not choked;left disc normal.He then had a convulsive attack,in which the four fingers of the right hand rapidly vibrated,contracting and extending without pain,there being no loss of consciousness or other disturbance.The tongue was also affected,so that speech was impossible.Later,the patient had a general convulsion,preceded by a drawing sensation in

the face;convulsive movements began in the right hand. The tongue was bitten during the attack.The seizure was preceded by a severe headache.He had another attack without loss of consciousness or convulsion,preceded by a sensation as of a knife cutting through the flesh,which travelled up from the left hand to the shoulder,and then to the head.Increasing loss of sensation in the fingers of the right hand,and increasing difficulty of speech, with spells of melancholia and crying,were observed.The right side of the face was markedly paralysed.The right arm was almost completely paralysed,and also much swollen.The speech was much affected,and the patient had great difficulty in swallowing.The right leg ultimately became paralysed.The diagnosis was made of cerebral gumma,and for this he was successfully treated up to the time he passed from observation.

Case 12.

This patient was a man of 33 years,who some time ago had syphilis,which,on account of existing alcoholism, did not show the usual speedy response to specific drugs. He had a fight and received several severe blows on the head.He thereafter suffered from headache,which was continuous,usually dull,and occasionally severe.Now and then he vomited.He was stupid,lacked energy,and was very drowsy.There developed partial anaesthesia on the right side,as hyperaesthesia on the left.His sight was impaired,his right ear became deaf,and he suffered from marked constipation.He contracted influenza,just as he was beginning to improve under iodide of potassium,mercurial inunctions,and the bromides;pneumonia occurred,and on the fourth day he had a general convulsion and died an hour afterwards.

Case 13.

This patient,a domestic servant of 27 years,had a strong history of syphilis.She was of neurotic disposition and now in the tertiary stage.There occurred headache with paroxysmal exacerbations at night.Vomiting set in,and this by the end of a month was almost continuous. Vertigo was complained of also,and later this became so severethat it prevented her from sitting or standing. The mind became slow and general hebetude was observed, as well as general muscular weakness,right partial hemiplegia and hemianaesthesia.Facial neuralgia then became an annoying complication,and was referred by the patient to the decayed condition of her teeth.The vision became impaired.There was marked slowness of respiration,which gradually improved,however,under iodide of potassium and mercury jointly in mixture administered,as did also the other symptoms - the patient ultimately recovering after a long and tedious illness in which a variety of symptomatic medicaments were also exhibited.

Case 14.

This patient was a soldier,aged 35,who during the late war was wounded in the head by a glancing bullet. He had had syphilis,and now developed headache of great severity at intervals.Vomiting occurred at the time of the headache.Failure of memory and depressed spirits were observed.Epileptiform attacks appeared;during the spasms he lifted up the right side of his body and worked over towards the left.There were occasional cramps in the stomach and legs,as well as temporal and orbital neuralgias,descending neuritis,constipation,and eventually atrophy of both optic nerves.He was given mercurial

injections;but they were utterly inoperative,and the patient lapsed into a general paretic condition and died in convulsions.

Case 15.

This patient was a married woman of 35,who contracted syphilis from her husband.She had had no children and was extremely neurotic.The disease was treated on the usual lines,and its external expressions disappeared,but the nervous system gradually began to show signs of involvement.There occurred severe headache,at first with long intermissions;later it was continuous,and often torturing.Vomiting with paroxysmal headache,coming on late in the illness.Vertigo usually with headache.The patient became excitable and very irritable.Slight twitching of the mouth,hands,and forearms.Left hemiplegia; upper as well as lower fibres of the facial nerve paralysed.Left internal strabismus.Electrical reactions impaired.Difficulty in speaking.Sensibility diminished in the left leg.Later,hyperaesthesia and great pain in the paralysed limbs.Conjunctivitis and necrosis of the cornea of the left eye;conjunctiva and cornea insensitive. Vision impaired.Descending optic neuritis.Hearing impaired on left side.Smell defective.Profuse perspiration more marked on the right side than on left.Constipation. Temperature,taken in the right and left axilla for eleven weeks before death,gave the following averages:Right axilla,99.1.,M.;100.,E. Left axilla,99.4.,M.;101.4.E.On some days remarkable falls in temperature to 96.,95., and even 94.and 93.F.On the death of the patient,which occurred in a condition of coma and exhaustion,a post-mortem examination of the skull contents was allowed. There was found a twin-tumour of a gummatous nature,each mass about two-thirds of an inch in diameter,in from of the optic chiasm.The growths involved the basal termination of the corpus callosum,the peduncles of the corpus callosum,the lamina cinerea,and anterior perforated spaces.They also probably encroached upon the roots of the olfactory nerves,the optic nerves and commissure, and the anterior portions of the circle of Willis,which seemed to have been broken in front.The base of the brain,from the posterior line of the neoplasm backward to the pons,was markedly softened.

Case 16.

This patient was a man of 33 years,who many years ago had syphilis,and had been several times mercurialised by various practitioners for that disease.The body showed fresh gummata and numerous scars of former lesions;and in the left ppliteal space there was a decided swelling corresponding to the popliteal artery.It was elastic cylindrical,with a diameter of about an inch and a half,and disappearing above and below beneath the muscular structures.The neoplasm showed distinct pulsation behind and at the sides.The dorsal artery of the foot and the posterior tibial pulsated synchronously;but the pulsation of the posterior tibial of the left side appeared a little weaker.There were no differences in sensation.The patient was given iodide of potassium in mixture in full doses and inunctions of mercury externally,and improvement was marked from the first.He persevered with the treatment,which later on took the form of mercurial injections,and recovered in six months.

Case 17.

This patient was a mechanic of 27 years,who had

been mercurialised for a chancre and a papular eruption following it.There also existed,in addition to mucous patches,recurrent roseola and psoriasis of the palm of the hand.Upon the inner surfaces of the legs and thighs, starting from the internal malleolus on each side,was found a firm cord,nodular in places and as thick as a goose-quill.It could be traced under the skin up to the fossa ovalis.Upon the right thigh it was swollen and formed a hard protuberance,the thickness of the thumb. The surrounding cellular tissue was infiltrated,and the skin was red and protuding in the form of a longitudinal tumour.The lesion was tender to pressure.There was no oedema.The patient was given mercurial injections,and the blue ointment was applied to the local lesion,which in ten weeks entirely disappeared.

Case 18.

This patient was a labourer of 32 years,who six years ago had syphilis,which was treated with the usual drugs,though rather carelessly it seems.During one of the intervals of treatment he developed paralysis of accomodation of the left eye,capillary hyperaemia of the fundus oculi,and infiltrations of pinhead-size on the skin of the ball of the thumbs.The mercurial course with iodides was forthwith resumed,and some improvement occurred;but on the fourteenth day haemorrhages occurred in the general integument and in the oral mucous membrane.He was then put on the arylarsonates,and though he had occasional bleedings from the kidneys,nose,etc.,he markedly improved.

Case 19.

This patient was a soldier of 35 years,who some time ago contracted syphilis of severe type,which ran through its classical stages.When first seen he had a gummatous infiltration of the corpus spongiosum,which had nearly transformed the part into a nodular mass about the size of the forefinger.This led to a perforation externally and into the urethra,a fistula being produced. About the opening the infiltration caused contraction, behind which the diseased urethra bulged out when micturition was performed.From the meatus and from the fistulous opening a thick granular pus could be expressed. The urine was rendered turbid by the same substance.The penis took on a downward curvature during erection.The urethra was in a condition of stricture.The patient did well on mercury and the iodides and local treatment according to indications.

Case 20.

This patient was a cabman,aged 35,who developed a chancre on the glans penis and in due course had the usual secondary phenomena.He was put upon inunctions of mercury,and four months after this he complained of pain in both testicles.The outer surface of the upper part of the left testicle showed a swelling,the size of a hazelnut,which was smooth and prominent and very painful to the touch;the organ was also diffusely swollen,and a certain amount of epididymis was present as well.Numerous small gummatous nodules were present on the general integument.The patient was melancholic and complained of headache and dizziness - all which symptoms,and the rest here detailed,vanished under the administration of mercury and iodide of potassium in mixture,alternating courses of the arylarsonates.

Case 21.

This patient was of the same age as the foregoing

and similarly employed.Eight years ago he had had syphilis.There was a large cavity visible at the back of the throat,which may or may not have communicated with the cervical spine.Gummata were also present on the skull, the hard palate,and some of the long bones,and there was difficulty in moving the neck.The patient was given iodide of sodium internally and also the inunction-cure. This was persevered with for twelve months,by which time a marked improvement was observed.

Case 22.

This woman,aged 41 years,had evidently had a severe form of syphilis,for her genitals were covered with scars.The spinal column in its upper part had evidently been involved,for the head,which was inclined to the right shoulder,was able to execute only slight nodding movements.The mouth,whose alveolar processes and teeth were directed forwards,could only be opened a very little,and not enough to allow complete inspection of the oral cavity.The nose,the septum of which was defective, contained gummatous infiltrations.Necrosis and perforation of the hard palate were observed.On the left,between the spinous and transverse processes of the upper cervical vertebrae,a piece of bone projected and held the vertebral segments rigid.The same treatment was instituted as in the preceding case,and when the patient passed from observation she seemed doing well.

Case 23.

This patient,a journeyman painter of 29 years,had recently contracted syphilis,chancre and syphiloderm being present in the usual places.He was put on mercury internally,and four weeks afterwards a painful swelling made its appearance at the lower end of the right ulna. After only a few days the pain had already extended to the margin of the joint,and the tumour also seemed now to be in evidence at the wrist-joint,so that the latter had to be placed in splints.The apparatus was removed four weeks later,when it was seen that the swelling had disappeared from the ulnar side of the joint,and had extended to the radial side.The articulation of the radius and wrist seemed loosened,and the grating sound elicited showed that the cartilages had been roughened. Marked pain was not present in the joint,which,however, was bandaged up again;and on its removal three weeks later nothing abnormal was found.Stimulant embrocations were prescribed,and the constitutional treatment continued - with the result that the patient made a good recovery.

Case 24.

This patient,a clerk of 35 years,had contracted syphilis seven years ago,and had the usual constitutional symptoms of the disease.Twelve months after infection,recurrent eruptions made their appearance,accompanied by headaches,which were especially severe on the right side.These lasted two or three years,until the patient woke up one morning with paralysed left extremities,although retaining full consciousness.In the course of a few months the left leg recovered,while the left arm,which was insensible to the prick of a needle for only a few days,remained paralysed eight months longer.Then spasmodic contractions occurred in the left arm,and never again ceased.These spasmodic contractions

were particularly marked in the flexors of the fingers. The more the patient's attention was directed to this, the less could he control the spasms;they diminished if the arm was thrown over the back,and ceased wholly during sleep.The muscular system was here strongly developed,more so even than on the right side.The patient was able to life quite heavy weights with the left hand.Sensibility was intact.The patellar reflexes were somewhat increased: otherwise the lower extremities seemed in a normal condition,and no paralytic symptoms could be discovered in the face or elsewhere.In the region of the coronary suture on the right side a marked flat enlargement of the frontal bone was present;but it was not tender either to percussion or pressure.There were no disturbances in defaecation or urination.The patient was a moderate drinker,and found that alcohol made him feel giddy and stupid the next morning.Mercury and the iodides were administered,with electricity locally;still, the benefit arising therefrom was inconsiderable.The headaches,which lasted for a long time,at last yielded to the arylarsonates combined with these measures.

Case 25.

This patient,a labourer of 45 years,had syphilis fifteen years ago.Thirteen years later,ulcers formed in the left leg,for which blue ointment was local used. He was first seen eight days ago,and complained of headache,and then complained of left-sided cephalalgia and a feeling of dizziness.The pupils were now moderately contracted,somewhat more so on the left side,and reacted only sluggishly to light and accomodation;there was also a slight paresis of the right facial nerve.The motor power of the left arm and leg was weakened,moderate ataxia was present,the patellar reflex was increased,and there was clonus of the foot on the left side;the patient swayed on closing the eyes,his gait was straddling and uncertain;with eyes closed the patient deviated to the right side in walking;over both legs a dry rattling was heard,the heart and arteries did not present anything abnormal;the pulse and respiration did not seem disturbed.On the leg,besides scars and pigmentations,there were deep ulcers covered with dirty granulations,and having a sharp border.Iodide of potassium was administered,and a proper local treatment of the ulcers was instituted.The headache increased,slowing of the pulse and vomiting appeared and became worse in spite of increasing doses of iodide of potassium.Disturbances of deglutition also appeared,and the patient had to be fed per rectum;at the same time he was given mercurial inunctions and the iodide.At the end of the second week he was seized with a suffocative attack accompanied by tonic spasms;the pulse had fallen to fifty-two beats in the minute.Gradually his appearance became brighter, vomiting ceased,and after three weeks he could take nourishment in the usual way.Improvement had barely continued a week when he had another relapse;and now Soamin injections were tried,in conjunction with mercury and the iodide in mixture - with the result that the symptoms ameliorated and the patient from thenceforth began slowly to recover.

Case 26.

This patient,a man of 40 years,had syphilis years ago,and had for several months complained of a weakness in the right hand,a burning sensation having been

previously felt in it and in the whole arm;the left foot was weak and was being dragged,and there was also a kind of tickling in the sole of the left foot;the lumbar region had for some time been stiff and bending forward was difficult.A commencing claw-like hand was present on the right side,deep atrophic furrows corresponded to the interosseous muscles,and the thenar eminence was absent.The power of voluntary movement was nearly abolished,and the opposition of the right thumb especially was impossible;the right arm was in general somewhat atrophic and felt cool to the touch;the sensibility, especially the sensation for pain and temperature,was markedly diminished in the whole extremity,but especially in the hand.The same condition was found in the left foot,which appeared narrow and presented very little prehensile play of the toes.The urine could be voided only after some waiting and fell vertically,the bladder having no expulsive force;it was turbid,and the residual urine was from two to four ounces;the bowels were somewhat sluggish.With the exception of slight exaggerated reflexes in connection with the patella,somewhat more pronounced on the left side,no other disturbances could be discovered.There was found on the thigh a cicatrix, surrounded by pigment,such as usually remains after a gummatous ulcer.The patient was at once put on iodide of potassium,and in a few weeks the sensory and other disturbances underwent marked improvement.A nearly perfect cure resulted in the further course of treatment,which comprised Soamin injections and the electrical treatment of the hand-muscles.The left leg became so strong that the patient was able to walk about outdoors.In time he made a perfect recovery.

Case 27.

This patient was a married woman of 33 years,who felt sure she had never suffered from syphilis.She complained of pain in the legs and a feeling of fatigue and numbness in them,as well as of a sense of bearing down in the rectum,which was so severe that she was unable to walk.Gradually she fell into a condition in which the faeces were passed of their own accord,and there was difficulty in passing water.Later,tactile sensation was lost in the neighbourhood of the anus,and the act of coitus produced no sensation.The fact of the patient having had syphilis was indicated by alopecia,an old bubo-scar in the right groin,and a pea-sized hole in the palate.Motion and sensation of the arms and legs was found to be normal.The skin over the lower part of the scarum was converted into a dry scab.Absolute anaesthesia was present in the skin of the external genitals as far as the border of the mons Veneris,in mucous membrane of the vagina,over the perineum and on the inner surface of the thigh,in the immediate neighbourhood of the fold between the perineum and thigh.The lower portion of the skin in the gluteal region and the mucous membrane within the anus was also anaesthetic,so that the patient did not feel the passage of faeces.The anus was not patulous and grasped the finger with a moderate force;the bladder was greatly distended,and the patient could pass only a small quantity of urine by forcibly straining.She could not feel the passage of the catheter,and was quite ignorant of the distended condition of the bladder.There being no motor disturbances,disease of the spinal cord was not present;and it was therefore concluded from the

symptomatology that she had a gummatous infiltration of the posterior roots of the pudendal and coccygeal plexus, with involvement of the posterior roots of the sciatic plexus from which the posterior femoral cutaneous nerve takes its origin. The patient was given the proper specific and symptomatic treatment indicated by her condition, and when she shortly afterwards left the district she was doing comparatively well.

Case 28.

This patient, a man of 61 years, contracted syphilis and had the usual constitutional disease in stages. Numerous gummata formed in various parts of the body, and some of them broke down and suppurated. The affection persisted in its severity of course, and the nervous system soon became involved. The man began to feel out of sorts and irritable, his friends noticed how ill he looked and made remarks. He developed anorexia, deafness on the right side, and thirst and the passage of large quantities of urine were observed. There seemed only negative symptoms in connection with the nervous system at this stage. He was given mercury by injection, but soon the physiological effects of the drug were noticed, and muscular tremors developed. The mercury was stopped, and the iodide of potassium administered. On this he improved a great deal; the appetite returned, his spirits became elevated, and the thirst and polyuria disappeared. At the twelfth month of the infection the patient noticed that as he arose from his armchair his right leg, without being useless, was still very clumsy, and had also a numb feeling. The right leg had a girdle-like feeling of constriction; the soles of the feet seemed to be absent, the patient losing his slippers without being aware of the fact; the rectum felt as though it always contained a heavyish load, but when the passage of faeces was not felt, the penile organ felt as though dead, and the act of micturition was unaccompanied by any sensation, and only by looking at the flow in process could he tell that his bladder was being emptied. No disturbances of sensation were experienced, and he could feel impressions on the skin. Under the administration of the iodides the patient slowly improved, and by the end of eighteen months he was almost well.

Case 29.

This patient was five years younger than the foregoing and of the same occupation, namely, a labourer. Some time ago he contracted syphilis; and for the last month had been attacked every evening, about the same hour, with excruciating pains in the fourth and fifth intercostal spaces. His contracted pupils reacted alike to light; there were also present paralysis of the right superior oblique muscle, abolition of the knee-jerk on the right side, and diminished patellar reflex on the left. The pain had of late radiated to the right hypochondrium and to both legs; girdle-pain was experienced. With this there was present a papular syphilide on the body and limbs. In the course of a fortnight the pupils lost their reaction to light and became irregular. The patient next showed ptosis on the left side and paralysis of the facial nerve on the other. The patient was given mercurial inunctions and full doses of iodide of potassium, and persevering with this faithfully he gradually recovered, though at the time of being last seen he was still paralysed on the right side of the face.

Case 30.

This patient, a mechanic of 39 years, had syphilis about twenty years ago, which ran through its usual stages and five years ago culminated in ulcerating swellings on the back and chest. Two years ago he was caught in the wet, and twelve months later developed what he thought was rheumatism, which was accompanied by difficulty in movement and weakness in the legs, especially on the right side, a feeling on tension in the back, and a sensation of constriction in the region of the stomach. The bowels were constipated, the urine was passed with difficulty. Lately he had complained of pain in the right arm, and movements of this member became uncertain. When he first came under observation he showed abolition of the knee-jerks, ataxia, and other tabetic symptoms of parasyphilitic reference, together with thickening of both tibiae and cicatrices on the back which had followed serpiginous ulcers; there were also disturbances of co-ordination in both hands, especially marked on the right side. The patient was given potassium iodide internally and mercury by inunctions. During the ensuing four months of this medication the ataxia notably diminished, and almost entirely disappeared from the arms; the numb feeling in the legs also took its departure, as well as the paraesthesia in the toes. The rectal, vesical, and other troubles also yielded to the antisyphilitic course.

Case 31.

This patient was of the same occupation as the foregoing, but ten years younger. He contracted syphilis of ordinary type and clinical course. For this he was treated elsewhere, and when first coming under observation showed a darkish, fairly hard induration the size of a pea, which mainly affected the conjunctiva, but also had its seat partly on the sclerotic. To the upper and inner side this infiltration touched a white corneal scar, which had been produced by a traumatism, and towards which the iris had been drawn and had become adherent; from below, a few larger twigs of blood-vessels were seen to pass to it. Both upper lids contained a number of tarsal gummata of the size of a small pea, which rendered the conjunctiva palpebrarum bulging, and on the free border of the right upper eyelid a small ulcer was seen. On the left side a retinitis was present. In addition to these lesions there were gummatous ulcerations in the pharynx and larynx, a few periostoses, and on the skin syphilitic pustules and gummata of some depth. The patient was prescribed iodide of potassium and mercurial fumigations, and in due course he perfectly recovered.

Case 32.

This patient, a coachman of 34 years, had long been syphilitic. Four years ago he was much troubled with jaundice; and for three years there had been periodical disturbance of digestion with vomiting and decided pain in the epigastrium, repeated distress, and attacks of fainting. The swelling of the cubital and inguinal glands showed the presence of the constitutional taint. There was at first scarcely anything demonstrable objectively except a constant sensitiveness in the region of the stomach. Ascites occurred subsequently, followed by general oedema. Biliousness, and later also bloody, vomiting were often observed. Nothing abnormal could be discovered in the urine and stools. The temporary swelling of the parotid during the course of the disease was of interest; it

was followed by purulent otorrhoea on the right side. Chronic syphilitic pancreatitis was suspected, and the patient was duly dieted and put on iodide of potassium and mercury in mixture, which, however, were only temporarily beneficial. He contracted intercurrent pneumonia, and at the seventh day died.

Case 33.

This patient was an engineer of 38 years; he had had syphilis about fifteen years ago, but otherwise had never been indisposed. His present illness commenced seven months ago with vertigal attacks, and later tremblings of the left extremities appeared. When first seen he was dazed-looking and had some difficulty in his speech. There were no respiratory abnormalities, and the only adventitious sound in the heart was a systolic murmur at the apex with the first sound. His appetite and digestion were not apparently impaired. Walking was difficult, and now and then he turned very excitable. His voice was indistinct and his speech stammering. His left arm was constantly moving about in all directions, and he could not control the movements thereof; the forearm was more affected than the rest of the limb, and the movements could not be arrested on using the member. The left leg was similarly affected, but in this case the movement was mostly from side to side. The knee-jerk was present in this limb, but abolished in the other one; the former was more powerful than the latter. The right side of the body seemed normal. All these movements ceased during sleep. He was put on iodide of potassium internally and mercurial inunctions externally, but these remedies seemed to produce little benefit, even when aided by symptomatic drugs. He a month later exhibited grandiose delusions and decided maniacal and dangerous propensities; his removal to an asylum became imperative, and he was then no more heard of.

Case 34.

This patient, a widow of 56 years and the mother of a large family all with the exception of three survivors dead in infancy, had never had either abortion or miscarriage; she furthermore statedthat to her knowledge she had never suffered from syphilis, though she had some peculiar skin eruptions not long after her drunken husband similarly suffered. Several discharging ulcers were found on the front of the shin-bone. Ten days ago she developed a swelling of the lower lip and pain in the mouth and tongue. The lower lip was found to be thickened, three times larger than the upper, and everted. The tongue was painful and affected with sclerosing glossitis. The legs were covered with scars, and the sight in both eyes was defective. She was put on iodide of potassium with mercurial inunctions, and at the time of the last observation was considerably improved.

Case 35.

This patient, a workman of 46 years, came of alcoholic and rheumatic parents. Eighteen months ago his left great toe became red and glossy. This kept him in bed for several weeks; the attacks were repeated on four other occasions. Thirteen years ago he had syphilis of the usual type, and his toe became painful for the first time three years later. He was addicted to the abuse of ardent spirits. When first seen he complained of swelling of the dorsum of the left foot of a few days' duration.

The right knee was now also affected,and the left one showed signs of incipient inflammation.The pupils were unequal.The appetite was somewhat impaired and the tongue coated with a dirty-white fur;the bowels were regular and the urine was voided without difficulty.Both lower extremities showed oedematous swelling,and the affected joints were swollen,red and shining.He was put on iodide of potassium and vinum colchici,together with local anodyne application.Persevering with the treatment he eventually recovered sufficiently to resume his employment.

Case 36.

This patient,a married woman of 30 years,acquired severe syphilis from her husband in the sixth month of her pregnancy.She first noticed small spots on her genitals,and a papular eruption three weeks after she was confined.This eruption was of the same kind as her husband showed;but she had condylomata on the vulva in addition.Together with the eruption she had mucous patches, angina and alopecia.She was in a very weak condition,so was kept in bed,and given one-grain doses of mercury,in the form of gray powder,three times a day,together with and quinine-and-strychnine mixture.In spite of this,the eruption became pustular;but on the exhibition of the drug by intramuscular injections the pustules dried up, scaled over,and left red and shining spots.About the sacrum and anus the pustules remained for some time;and it was only when the full limit of physiological toleration was reached that they disappeared.She continued thereafter to take iodide of potassium and perchloride of mercury in mixture and when last seen was free from all symptoms of the disease.

Case 37.

This patient,a labourer of 58 years,had never been married.He had been rheumatic for three or four years. He had syphilis twenty years ago,and was treated for ten months in the usual way.He had lately been out of work and most of his chance earnings he spent in drink; he was very thin and dejected-looking.About a fortnight ago he developed pain and swelling in the left foot,and this prevented him from going about.His nervous system seemed normal,and the respiration was not disturbed.The appetite was fairly good,the tongue clean,and the bowels regular;there was,however,some difficulty of micturition. A ventricular systolic murmur was present at the apex of the heart,and a scar was present in the right groin.The relics of a palmar psoriasis were observed.The patient was put on the iodide of sodium and mercurial inunctions, and when he left the district he seemed doing well.

Case 38.

This patient was a grocer,aged 29 years,who less than a week ago,whilst drunk,had intercourse with a syphilitic woman.On examination,several reddish spots were seen on the glans penis;they were yellowish and had a pustular point crowning each.He was given a dusting-powder of calomel and black wash for local use.Next day the yellow centres had burst and revealed small circular ulcers with an abundant discharge od pus.The medication was persevered with,and the majority of the ulcers showed improvement in a few days,and by the end of a week only two of them remained.These were circular in shape and cleancut,but had undermined edges.The discharge was still yellow and copious.The inguinal glands on both

sides were enlarged,but were neither red or painful on pressure.The ulcers in question remained in evidence for about three weeks longer,and the abundant discharge became more brown in tint and much thinner. Then marked induration of both ulcers was noticed,though the discharge had by now almost dried up,and a deep areola surrounded each ulcer.The floor of the latter,however,seemed not so deep as hitherto,and the typical appearances of a hard chancre was presented.The patient was given injections of a ten per cent.solution of calomel in olive-oil,then drops of this constituting a dose.But the pain following the injections was so great that oleum cinereum was,after the third injection,substituted in ten-minim doses.Improvement was marked under this form of medication,and comparatively little pain was experienced.The chancres underwent a marked diminution in size;the induration became less appreciable;and both healed over by the end of the sixth week,leaving scars of small size and whitish tint.The injections were continued for six weeks longer,and during that time no secondary expressions of the constitutional taint appeared.He now left the district,presumably cured or much relieved.

Case 39.

This patient,aged 65,a labourer had had syphilis in youth,and had never been an abstainer from alcohol. Two months ago he suffered an accidental abrasion of the left leg,and this,instead of healing,proceeded to ulceration.The nervous and respiratory systems were normal, considering his age;and the same remark applies to his other functions.On the second finger of the right hand w was a whitlow;there was a cicatrix on the dorsum of the left foot and a large,deep,irregular,foul,discharging ulcer on the inner aspect of the lower third of the left leg,which was very painful and surrounded by an inflamed and oedematous area.There was an eruption on the trunk, and also a scar in the right groin.He was given mercury and iodide of potassium internally,and this led to cleaning of the ulcer and healing of the finger.He continued with the treatment,and recovered after several months' medication in this way.

Case 40.

This patient,a groom of 35 years,had syphilis about a decade ago;it was of rather severe type,and the syphilodermata were well-marked.When first seen he had several small superficial ulcerating gummata on the left side of the tongue.They were about the size of a pea, numbered five,and had overhanging edges.The surface of the organ was elsewhere smooth and shiny,and showed atrophy of the papillae.The soft and flabby edges of the tongue were indented by the teeth.He was given a short course of mercury and iodide,and later one of Soamin,together with antiseptic gargles.After the termination of this hundred-grain course two of the ulcers were still in evidence,though markedly less,whilst the others had healed into depressed scars.He was then given potassium iodide for three weeks,but no improvement occurred.The above-mentioned injections were accordingly resumed;but cephalalgia,epistaxis,and abdominal pains necessitated their abandonment after the injection of twenty grains.But the ulcers were now healing rapidly, and one of them was almost well.The iodide and mercurial inunctions were now prescribed,and in a few weeks the patient was apparently cured.

Case 41.

This patient was a joiner of 68 years,who had syphilis at the age of 25.Yesterday he vomited and shivered,and felt very ill.The nervous and respiratory systems appeared normal.The tongue showed leucoplakia; the outer parts were smooth,shining,and pearly,and the middle of the organ was in angry folds.Auscultation revealed a systolic murmur at the apex of the heart,and the cardiac dulness was increased to the right.He was given a mouth-wash composed of glycerine and borax,which markedly benefited the tongue.The iodide of potassium was administered internally,and the blue ointment was rubbed upon the skin.In the course of four weeks the local symptoms disappeared.

Case 42.

This patient,an apprentice aged 18,had a hard chancre on the corona glandis,with bilateral shotty and indurated inguinal glands.Five weeks ago he was exposed to the risk on infection,and his worst fears now received verification.The chancre was treated with black wash,and for the constitutional condition injections of oleum cinereum were practised in the way already described.After the third injection,a faint roseolar eruption make its appearance on the chest and back;but these spots were the only active troubles observed.The chancre disappeared after the fourth injection,and he now no longer complained of sore-throat.The injections were administered weekly on six occasions.Five months later he was subjected to close inspection;but for the penile scar and the induration of the groin glands,there were no signs of the disease about him.He continued with the injections for eight weeks longer in fortnightly séances, and by them he expressed himself as satisfactorily cured.

Case 43.

This patient,a man of 36 years engaged as a painter,had syphilis five years ago,for which he seems to have been carefully and successfully treated.He had been out of work of late and addicted to a vicious,alcoholic life.About eighteen months ago he developed a cough and expectoration;six months later he began to spit blood. Nocturnal perspirations appeared,and he began to lose flesh.When first seen his breathing was short,and great substernal pain was experienced.His cough was also troublesome,and the sputa were blood-stained.He had anorexia,though his tongue was only a little coated,his bowels regular,and the urinary function normal.Percussion on the right side of the thorax revealed an impaired note.Rhonchi were audible all over the lungs,and both organs crepitated behind.The cardiac sounds were not abnormal.A month later the cough was much worse,the expectoration purulent and abundant,and the breathing quick and short and laboured.He perspired profusely during the night,and there was a hectic flush on the cheeks. The bowels were now constipated.There was dulness on the front of the right lung,and râles all over,with vocal resonance and crepitation behind.The pulmonary tuberculosis from which he suffered being referred to syphilis, he was prescribed mercurial inunctions with iodide of potassium in mixture with pulmonary sedatives;but he became gradually worse,and died a month after being first seen.

Case 44.

This patient was a married childless woman of 28,

whose husband infected her with syphilis,as manifested by a chancre on the vulva.When first seen she had large pea-sized papules on the buttocks,which itched very much. No eruption could be discovered on the body.The throat had been sore,and her hair had been falling out for some time.Some of the papules were showing a tendency to pustulation,whilst most were desquamating and of a reddish-brown tint.No trace of the chancre could be seen,though the inguinal glands were much enlarged and hard.The patient was prescribed doses of a third of a grain of the green iodide of mercury,in pills,three times a day. At the end of the first week the dose was increased to half a grain thrice a day,and in the third week to three-fourths of a grain at the same daily times.By the end of the third week mercurial stomatitis was observed,and this,moreover,despite the regular employment of gargles of alum and chlorate of potash.The dose of the mercurial was now reduced to half a grain,three times a day,during a period of three weeks;at the end of which time the rash had markedly improved.The three-quarter-grain pills were again administered thrice daily,and continued for six weeks;this led to an entire disappearance of the skin trouble.The medication was persevered with,and the occasional enteric symptoms were relieved by the combination of one-grain doses of Dover's powder with the specific drug.From now she remained free from all signs of the disease.

Case 45.

This patient,an unemployed man of 36 years,contracted syphilis two years ago.He complained of lancinating pains in the head,and of a pressure-sensation at a tender spot at the apex of the skull towards the left side.Insomnia was not present.He had some cough,faucial irritation,and a certain amount of expectoration.The appetite was not impaired,the breath had rather an unpleasant odour,but the bowels were regular.The knee-jerks were normal,and a brownish pigmentation was present on the abdominal wall.The right lung in front and behind gave an impaired note,and there was increased vocal resonance on the anterior aspect of that organ. There was nothing abnormal in connection with the heart. The right groin contained a scar.Four days later he complained of a smarting pain on the top of the head,which spread to both sides,especially to the left.This lasted for five weeks altogether.He was given ten-grain doses of iodide of potassium three times a day,and at the same time one-grain tablets of gray powder.He persevered with the treatment in in six months he was perfectly cured.

Case 46.

This patient a single woman of 36 years,contracted syphilis,and had the secondary symptoms in due course. When first seen she was found to be suffering from severe ulceration ofthe fauces and cheeks.Large condylomata were present around the anus andon the inner aspect of the thighs above,and a pustular syphilide covered the back and loins.Debility and syphilitic anaemia were very marked.She was given a full course of Soamin,together with ferruginous and other tonics.After each injection she had headache and severe palpitation,but despite all this she persevered.She was well rewarded for her therapeutic assiduity;for the ulcers healed over,and the condylomata had entirely disappeared by the end of the course.The rash,after a few mercurial fumigations,also took its departure,and the patient seemed cured.

Case 47.

This patient, aged 58, was a mason and had syphilis many years ago. He seems to have been of fairly temperate habits. About two years ago numbness of the right hand appeared, and this he attributed to exposure to cold and extra-hard work. This became worse, and within two months of its first appearance, the member became practically useless. Four months later he became conscious of a weakness of the left knee; the entire member became even weaker, and he was unable to go about. The right leg also showed a certain amount of impairment of mobility. Six months ago the left arm also became numb and weak, and four weeks ago a lumbago-like pain appeared. The eyesight was fairly good, though lateral nystagmus was present in slight degree. His speech was thick and indistinct, and the respiratory system was normal. The tongue was large and furred and tremulous; the alimentary and urinary systems were not diseased. The patient couldnot grip with the right hand, and the power of the left was inconsiderable; he was aboe to use his arms. The reflex of the left patella was abolished, and that of the right was very sluggish. Both legs showed oedematous swelling, though they were still fairly strong. The muscles of the arms were flabby; tactile sensibility in the extremities was not abnormal, and the legs seemed well nourished. He was at once put on antisyphilitic treatment, and by the end of a fortnight he seemed a little better. But now the bowels became constipated, and the joints were all painful on movement; this pain local inunctions failed to relieve, and it became generalised almost at once. Nothing seemed to do him good during the ensuing three months; bedsores developed, and the heart apparently becoming myocarditis he died.

Case 48.

This patient, aged 33, was a bricklayer, who had acquired severe syphilis some years ago, for which he received a months' mercurial inunctions. Of late he had experienced nocturnal headetorture and pains in the bones whilst in bed. Of these pains he still complained when first seen, and he said that diarrhoea had troubled him for many weeks. He was slightly jaundiced, and complained of pain in the region of the liver, especially on taking a deep breath. The liver was seen to be enlarged and tender, but no signs of active inflammation of that organ could be detected. The diarrhoea was forthwith checked by a mixture of chalk and opium, and the latter ingredient caused a considerable diminution in the pain. On the cessation of the intestinal catarrh mercury, in the form of the tannate, was administered three times a day, as well as iodide of sodium and five-drop doses of the solution of morphia. The icteric symptoms rapidly disappeared, the liver returned to its normal dimensions, and after three weeks of the treatment the patient was quite free from pain. The osseous, rheumatic-like pains, however, were still complained of in the bones and the joints, but in six weeks these were cured by the addition of ten-grain doses of antifebrin and salicylate of soda to the therapy above outlined.

Case 49.

This patient, a married woman of 28 years, seemed to have been infected with syphilis by her husband who was a bookmaker's tout, though she in loyalty denied the possibility of this. She had been confined once, and this

child was alive and apparently quite well.She had never miscarried or aborted;nor was she addicted to stimulants. Previously she had been quite healthy,and had suffered from no neurotic taint.Three days ago she awoke to find that her right arm and leg were useless,and also that something was wrong with her mouth.She was therefore bedridden when first seen.It was noticed that she could not move the affected members,that she was deaf and dull,and that her pupils were unequal.The right knee-jerk was present,though the left one was less easily elicited.Ankle clonus was present,and the tibiae were in their normal state.The right pupil was more dilated than the left,and both appeared to be normal to accomodation and light.She seemed abnormal in her mind,and she was unable to talk properly.The deafness was partial,and had appeared only with the first attack.The respiratory and circulatory systems were normal.The teeth were irregular and decayed,and the bowels were constipated.Her old angi-na had recently disappeared.She evidently suffered from gonorrhoea.She was prescribed iodide of potassium in mixture with sarsparilla,and under this,together with mercurial inunctions,she gradually improved;after six months medication she seemed quite well again.

Case 50.

This patient a child of 12 days of age,suffered from marasmus and snuffles.The mother was ultra-virtuous and indignantly denied the possibioity of syphilis,though for a long time she had suffered from osteocopic pains and loss of hair.The infant weighed six and three-quarter pounds,and had a dusky patch over the malar bones and chin.The skin was loose and wrinkled,giving the patient am aged and withered appearance.A discharge was oozing from the nose,and the abundant crust-formation there interfered with breast-feeding.Whitish patches were present in the mouth,but no skin eruption could be seen.About fifteen grains of blue ointment were applied to the belly under a flannel binder,with the order that it should be constantly worn.The nose was kept clean by pieces of boric lint,and the crusts were removed by an alkaline solution.A drop of weak glycothymoline and adrenalin - one in ten thousand - was instilled into each nostril,and chlorate of potash was ordered for the lesions of the mouth.Under this form of medication the snuffles soon improved,the child markedly increased in weight,and the breast could be comfortably taken. A fortnight later a papular efflorescence made its appearance on the belly,and it quickly invaded the extremities. The papules were larger than those characteristic of the adult disease;they were of a ham-red colour and soon entered upon desquamation,leaving a raw surface behind. The inunctions were now given up and five-minim doses of corrosive sublimate in milk prescribed;after two weeks the rash showed signs of improvement,and by the end of six weeks had,with the exception of a few spots about the genitals,vanished.Then the patient had half-grain doses of gray powder added to the therapy,and now and then a variation in the form of inunction.The specific symptoms disappeared,and the child made a good recovery in time.

Case 51.

This patient was a middle-aged fireman,who a few years ago contracted syphilis.Two or three years later his suffered an injury to his left arm during the course

of his occupation.Six months ago he was under treatment for leg ulceration.A month ago his right leg became painful and swollen,though no history of injury to the part could be ascertained.Nocturnal algesic exacerbations were complained of.The patient had arcus senilis.The breathing was easy and painlessly performed.There was a slight cough,but no sputum was raised.The appetite was good,the tongue furred,the bowels constipated,and the urinary function regularly and easily performed.The left arm showed the scar of the accident above named;and there was a painful,tender,inflamed swelling over the upper third of the right tibia which was markedly enlarged thereabouts.Slight oedema appeared in the right leg,which also showed a condition of hallux valgus.The chest was for age not abnormal;at the apex of the heart a slight ventricular systolic murmur could be heard.He was prescribed iodide of potassium and mercury in mixture,and on this he greatly improved up to the time he passed from observation.

Case 52.

This patient,a child of seven days,came of a syphilitic mother,the disease having been acquired before her first pregnancy,and culminated in all others,with the exception of this one,terminating prematurely.The infant had well-marked snuffles,a harsh unpleasant cry, mucous patches in the mouth,well-marked areolae,and a few papules on the soles of the feet;it was very thin and feeble.Blue ointment was applied to the abdomen under a binder,and by the eighth week the eruption had entirely disappeared.The weight markedly increased;the snuffles much improved,and the mouth now contained no mucous patches,merely a few scars at the angles of the lips.Then gray powder was administered in half-grain doses three times a dat,with the result that the improvement was well maintained,and the patient recovered .

Case 53.

This patient a middle-aged man of the working class,had syphilitic symptoms sometime in his thirties, and an arthritic disease - probably specific - ten years later.He now complained of cephalalgia,vertigo,and polydipsia.Vision seemed unimpaired,and he was able to walk quite well,though he suffered from dyspnoea without pain on exertion.He had a cough,and raised some thick sputum every time.He had an eruption on the legs when first seen,and this later spread to the arms.The integument of the trunk was dry.But for a ventricular systolic murmur,examination of the thorax gave negative results.The penis and groin showed cicatrices.He was duly mercurialised and improved somewhat.Three weeks later sugar appeared in the urine.Five days later he was free from pain,and his appetite seemed better.His temperature rose in the evening,and his cough was rather troublesome.On the fourth day after this the sugar had disappeared from the urine,and he was able to walk much better than heretofore.The urine was abundant, he slept quite well,but any undue extertion made him breathless.He did very well indeed under specific therapy for a fortnight,but when out one day he got wet to the skin,developed a double pneumonia and died on the second day of the attack.

Case 54.

This patient,a farm-hand of 40 years,four years ago became syphilitic;since then he has been treated

at intervals by one practioner and another for various manifestations of the disease.Eight months ago some lumps appeared in the calf of the right leg,and these soon broke down and ulcerated.The affected part was seen to be covered with a number of typical serpiginous ulcers, with well-defined bases covered with granulations,and a gummy secretion oozing therefrom.There was marked bilateral inguinal adenopathy.He was prescribed full doses of iodide of potassium and corrosive sublimate in mixture, which,however,produced toxic symptoms very soon;it was abandoned at once and five-grain doses of iodoglidine substituted for the iodide content.Black wash and red oxide of mercury ointment were locally applied.The ulcers rapidly healed,and seemed cured by the end of two months,the dose of the last-mentioned medicament being doubled.The patient then left the district and was no more seen.

Case 55.

This patient a shoemaker of 50 years,was the father of ten children,of whom seven survived.He had syphilis when 20 years of age,and he was far from abstemious in his habits.Eight days out he returned from a tavern carouse and noticed that one of his legs was swollen.A few days later the legs,and then the feet,began to dwell, and the swelling gradually spread.He had a cough and suffered from dyspnoea for several months,as well as cephalalgia and vertigo.He had easy respiration when at rest;there was only a little expectoration raised with the slight cough,and now and then a pain was felt in the left side.The appetite was not impaired,the bowels were regular,and the urinary system was normal.The back, scrotum,penis,abdominal wall,and the legs and feet all became oedematous.The tibiae showed irregularities and thickening.The upper lobe of the right lung gave an impaired note,and also increased vocal resonance.The heart sounds were regular,the first sound being modified and a murmur accompanying the second.The left groin showed a scar.Three days later he complained of pain over the heart and headache.His urine now contained much albumin.He was given a mixture containing digitalis, spirits of ether and ipecacuanha wine,together with iodide of potassium and mercurial inunctions for the constitutional taint.On this he improved in every respect,and when he was last seen had regained a large measure of health,though still showing the signs of his chronic cardiac disease.

Case 56.

This patient was a clerk,aged 29,who contracted syphilis recently.A typical Hunterian chancre made its appearance on the corona glandis about four weeks after infection.When first seen he had a largish ulcer on the penile organ in locality named,which showed indurated edges;the groin glands of the right side were shotty, those of the left being only slightly enlarged.There was not a trace of eruption on the body.He was at once given the usual full course of Soamin,the injections being made as close to the lesions as convenient,namely, on the upper and inner aspect of the thighs,the two sides being operated upon alternately.Twelve injections in all were given.The effect was marked as regards the secondary phenomena,since only a very slight roseola appeared.The injections being made hypodermically caused great pain,so the intramuscular method was adopted.The patient was in this way perfectly cured.

Case 57.

This patient, aged 23 and a house-painter, complained of an extensive papular syphilide, which in certain localities exhibited a marked tendency to pustulation. When first seen the chancre had healed; according to the patient, it had been of very small size. The inguinal were hard and shotty, and ulceration of the throat and mucous patches were observed. The patient seemed ill and cachectic. Oleum cinereum was administered by the intramuscular method. But the eruption underwent no improvement thereby, and after the third injection became pustular all over. He was therefore given an intramuscular injection of Soamin; about twenty-four hours afterwards, physiological symptoms of the drug appeared, marked by gastro-intestinal catarrh and oral troubles. Gargles of chlorate of potash, and Dover's powder internally soon caused these accidents to disappear. The Soamin, after the full course had been employed, was discontinued, and the patient put on mercurial injections, six of them being given at ~~e~~ weekly intervals. Then a rest of a fortnight was allowed; but the eruption being still present, though slight, the Soamin was again resumed. This dispelled the efflorescence, and only pigmentation relics remained. The patient, considering himself cured, now abandoned the treatment.

Case 58.

This patient, a woman of 46 and a widow without children, was a lodging-housekeeper. She was a confirmed alcoholic, and being of loose morals, contracted severe syphilis some years ago, for which she was somewhat irregularly treated. About two months ago she had become irritable, talkative, and restless, with loss of speech now and then. Her memory was found to be defective, and she was very emotional and wayward in disposition. There was dulness on percussion over the upper lobe of the right lung in front, but otherwise the respiratory system was normal. The heart was in a good condition, but the arteries were rather thicker than they should have been. The knee-jerks were abolished on both sides, but there was no incontience of urine or faeces. She had a gonorrhoeal discharge, which was treated with protargol injections. She was also prescribed a mixture of potassium iodide and corrosive sublimate, and on this she began slowly to improve, though now and then given to neurotic attacks. She continued with the treatment for sixmonths, and by that time seemed tolerably well.

Case 59.

This patient was a tavern-keeper, who many years ago had severe syphilis. A year ago his nervous system became affected, and he found that he could not walk without assistance, his gait being as staggering as that of a drunken man. For a large part of his lifetime he had been a heavy drinker, but for the last three years had taken a great dislike to alcoholic beverages of all sorts. A month ago he felt weakness and pains in the back and legs, especially when in bed at night. One knee frequently gave way when he tried to stand. The leg became inflamed and extremely sore. The pupils were unequal, the left one being dilated. They both reacted to accomodation, but not to light. His hearing was defective, his speech thick, and his memory bad. There was a slight cough, some sternal pain, but neither expectoration nor dyspnoea. His tongue was large and furred, but the appetite not impaired; the throat was rather sore, and the bowels

acted regularly.Sometimes he had pain with micturition, the urine being voided naturally sometimes once a day, and sometimes frequently and involuntarily.He could grip quite well with both hands.The knee-jerks were absent.On the left leg were scars and varicose veins,and on the dorsum of the right foot an ulcer was present.The chest was scarred.The respiratory system was normal,and the heart merely revealed on examination some slight modification of its sounds.Both groins contained scars.The temperature,pulse,and respiration were normal.He could not walk down a hill without great caution,as he felt that he must fall.He progressed well on the level ground,and had no difficulty in ascending an incline. Sometimes,when walking about one foot would get behind the other somehow,and then he would fall to the ground. About a year ago he noticed that,when he shut his eyes when washing his face,he fell into the basin.In a dark room he would fumble about like a man stricken blind,and ultimately fall.Twelve months ago he could not walk without his eyes fixed on the ground.At that time his speech was affected,but of late he had inproved in this respect.Co-ordination of hands and fingers was good with the eyes open.With feet approximated,eyes open and looking at the floor,there was slight incoordination.In the same position,looking at the ceiling,incoordination was marked,as also with the feet together and the eyes closed.With feet approximated,eyes open and a card placed between his chin and the floor,there was less incoordination.He had an ataxic gait,and walked with his legs wide apart with the aid of a stick.He felt as if treading on indiarubber.He was put on mercury and iodide of potassium and mercury internally,and at the present time is improving somewhat

Case 60.

This patient was a domestic female servant of 25 years,who six months before coming under observation was exposed to the risk of infection.One month afterwards a hard chancre appeared upon the left labium majorus,and then in usual course angina,adenopathy,and syphilodermata appeared.The eruption was very profuse over the face and trunk,and when a fortnight out took on hypertrophic tendencies.For cosmetic andother reasons it was important that a rapid cure should be effected;and mercury and the iodides being of tardy action,atoxyl was tried.The patient was given three injections of seven and a half grains during the first week,and then another one after four days' rest.Then the efflorescence was seen to fade rapidly,and in a fortnight it had entirely gone.The patient was now prescribed a mixture of mercury and iodide of potassium for regular use;and when last seen she was quite free from syphilitic manifestations.

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