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OUTLINES

OF THE

PATHOLOGY AND TREATMENT

OF

SYPHILIS

AND ALLIED VENEREAL DISEASES

BY

HERMANN VON ZEISSL, M. D.

LATE PROFESSOR AT THE IMPERIAL-ROYAL UNIVERSITY OF VIENNA

SECOND EDITION, REVISED

By MAXIMILIAN VON ZEISSL, M. D.

PRIVAT-DOCENT FOR DISEASES OF THE SKIN AND SYPHILIS, AT THE IMPERIAL-ROYAL UNIVERSITY OF VIENNA

AUTHORIZED EDITION. TRANSLATED, WITH NOTES,

By H. RAPHAEL, M. D.

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LONDON:

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1887.

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PREFACE TO THE AMERICAN EDITION.

A TREATISE on Syphilis by one who has devoted his entire life to the study of this disease, and whose experience is the result of observation and treatment of upward of thirty thousand patients in private practice and in the wards of the Allgemeine Krankenhaus of Vienna, needs little additional testimony to attest its value. As a clinical observer of venereal diseases, and as a teacher, Professor von Zeissl stood deservedly high in Europe. The concise and graphic description of the various forms of venereal affections, the accurate delineations of the different phenomena of the pathological lesions, the terse and detailed account of the symptomatology and characteristic manifestations of the various phases presented by the different specific diseases, the conscientious records of results obtained, bear evidence of the scientific thoroughness with which the investigations were pursued, and therefore must serve as a valuable guide to those desiring to study them. The prominence given to pathology in this work indicates the value placed upon it by the author as a means to the proper understanding of the diagnosis and treatment of the various venereal affections; and if it can not be said that the work contains an abundance of remedies and formulæ for the treatment of the different phases of the different diseases,

neither on the other hand is it overladen with polypharmaceutical combinations.

The few notes and prescriptions added by the translator will not, he hopes, be deemed superfluous.

H. RAPHAEL.

NEW YORK, *May, 1886.*

PREFACE TO THE SECOND EDITION.

The first edition of this book was composed for the purpose of placing in the hands of the student a brief guide to aid him in the study of Syphilis. Having been requested by my father to revise the second edition, it occurred to me that the reader would be pleased with it still more if, by making it as brief as possible, it should be as graphic and perfect in the description of the morbid picture of venereal diseases as possible. I sought to diminish the size of the book by omitting certain special subjects, giving greater prominence to clinical descriptions. Some chapters, which are only theoretically important, or methods of treatment that are only of historical interest, have been briefly sketched. The syphilitic affections of the skin were taken entirely unaltered from the former edition, while the chapters on therapeutics of gonorrhœa, of epididymitis, of strictures, of chancres and syphilis, as also the chapter on visceral syphilis and hereditary syphilis, have been almost entirely rewritten. Here and there parts of the fourth edition of the "Lehrbuch für Syphilis," issued by my father and myself, were used. Professor von Schrötter and Professor Mauthner were so kind as to write the articles on syphilitic affections of the larynx, trachea, and eye. I am fully aware that the book offers little that is new, but it is not intended that it should spread any new doctrines; it claims

only the modest task of presenting a comprehensible picture of venereal diseases and their treatment as briefly as possible to the practical physician, whom time will not permit to read extensive works upon every special branch of our science.

It only remains for me to express the hope that this book will receive the same friendly judgment as the first edition, and that I shall succeed in concisely reporting my father's ideas, and at least preserve what he created. For the words of our great poet find their application in science too:

> "Was du ererbt von deinen Vätern hast,
> Erwirb es, um es zu besitzen."

VON ZEISSL.

VIENNA, *March, 1884.*

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INTRODUCTION.

Infectious discharges from the genital organs of both sexes, and ulcerations on those parts, must have been known in olden times, even in the remotest antiquity. There is an allusion to an "unclean seminal discharge" in the third book of Moses (Leviticus, chap. xv), and the sanitary regulations prescribed by Moses himself indicate conclusively the actual infectious nature of such seminal discharges. It is likewise seen, from the writings of the old Greek and Roman physicians, that they treated ulcers of the genital organs which were caused by contagion.

At the end of the fifteenth century many persons were attacked, as in an epidemic, with morbid phenomena, especially diseases of the skin, whose origin the physicians of those times regarded as being due partially to telluric and partially to astral causes. These affections were supposed to originate in a general deterioration of the cardinal secretions of the body and the liver as being the fountain of the disease. Not until it became apparent that these diseases prevailed among the troops of Charles VIII, which occupied Naples in 1495, and occurred especially among those women with whom they had sexual intercourse, did many physicians become convinced that the diseases in question originated by transportation from one person to another—this transportation or infection occurring especially during sexual congress, and starting with an affection of the genital organs. These circumstances led Fernelius and Bethencourt to call this disease *venereal*, or the *veneria*, and also "lues venerea." For the same reason it was also called mentulagra (from mentula, penis), when it attacked men, and pudendagra when it attacked women. At the time when it prevailed as a pest it received various names, based

mainly upon geographical grounds. The French called it "mal de Naples" and "la grosse vérole"; the Spaniards, "las bubas" (pocks). The Germans and Italians called it "mal de France"; the Poles, the "Dutch disease"; the Dutch and English, the "Spanish"; the Orientals, the "French"; the Portuguese, the "Castilian"; the Persians, the "Turkish"; and the Chinese, the "disease of Kanton" (Kouang tong Tschouang). But all these designations were supplanted by the name of syphilis, which has been universally adopted. This term was first applied to the disease by Hieronymus Fracastorius, deriving it from a shepherd by the name of "Syphilus," whom he apostrophizes in an ode, as the first to suffer from this disease because he had offended the gods. Others derive the name syphilis from the Greek word *σιφλός*, broken; others, again, from the words *σὺς* and *φιλία*.

The infectious discharges from the genital organs are called in males, "gonorrhœa"—fluxus sive profluvium seminis, from *ἡ γονή*, semen, and *ῥεῖν*, to flow; in females, "fluor"; in German, "Tripper." The terms blennorrhœa and blennorrhagia mucifluxus, from *τὸ βλεννος*, or *ἡ βλέννοα*, mucus, and *ῥεῖν*, or *ῥηγνόναι*, were first used by Swediaur.

We are indebted for the designation of the word "chancre," as applied to a sore on the genital organs originating from sexual intercourse, to the French, who substituted the word chancre for cancer, which Celsus had selected to designate this disease. With the word cancer Celsus wished to describe the spreading, corroding, malignant character of the ulcer. The physicians of the thirteenth and fourteenth centuries selected the words "caries," "caroli," or "taroli pudendum," to designate such malignant contagious ulcers.

THE VENEREAL CONTAGIONS.

Fernelius was one of the first to properly comprehend the connection between diseases of the genital parts and syphilis. He suggested the hypothesis of the existence of an animal poison which he called the venereal poison. This virus, Fernelius believed, developed not only in the purulent secretion of certain ulcers of the skin and mucous membrane that originate during sexual intercourse, but also in the muco-purulent discharge of the inflamed or catarrhal affected mucous membrane of both sexes. From these two affections of the genital organs, Fernelius contended that the venereal virus passes into the secretions of the body and then attacks sometimes one organ and then again another. He was therefore of the opinion that syphilis, until then such a mysterious disease, resulted from well-known affections of the mucous membranes and of the skin covering the sexual organs, which we to-day designate as chancre and gonorrhœa (clap).

The opinion that gonorrhœa and chancre were the commencement of syphilis prevailed till the second half of the eighteenth century. In the year 1767 Balfour, an English surgeon, positively asserted that gonorrhœa and syphilis were essentially distinct diseases. Balfour's assertions, however, were stoutly opposed by John Hunter, who, in 1767, first instituted comparisons between the two diseases by performing inoculations with the secretions of venereal catarrhal affections of the mucous membranes and of venereal ulcers of the skin. Hunter inoculated the penis and prepuce (whose is not stated) with pus which he derived from the urethra of a patient presumably affected with gonorrhœa. As ulcers developed from these inoculations, upon which induration of the lymphatic glands of the right groin soon supervened, and a few months later ulcers of the tonsils and a roseola eruption

became superadded, which symptoms of constitutional syphilis were promptly cured by mercury, Hunter deemed the identity of gonorrhœa and chancre as complete, and consequently also of the contagion of gonorrhœa and syphilis as conclusive. The difference in the form of the manifestations of this contagion he believed to be due only to the differences in the anatomical structures upon which the lesion was produced. Upon the secreting mucous membrane the poison in question produces a catarrhal, upon the general cutaneous covering an ulcerative, process.

The first one to oppose Hunter in this matter was Benjamin Bell, of Edinburgh. He adduced the following facts: Two young persons scarified the skin of their glans penis and prepuce with a lancet, and allowed bits of charpie dipped in gonorrhœal matter to remain in contact with the scarifications for forty-eight hours. In one of the young men a balano-blennorrhœa ensued; in the other, some of the dripping pus gained an entrance into the urethra, in consequence of which a catarrhal disease developed in two days in this canal. On the other hand, one of the experimenters, by carrying the pus of a venereal ulcer of the skin of the genital organs upon a probe several millimetres deep into the urethral canal produced a painful ulcer at this place, which was followed by a suppurating bubo. Notwithstanding this and many other similar experiments, the virus of gonorrhœal with chancre contagion was supposed to be identical till the thirtieth year of the present century, when Ricord first took sides in the matter. By the aid of Récamier's vaginal speculum, which was used very little by his predecessors and contemporaries, Ricord disproved Hunter's views, by the fact that venereal ulcers may exist upon the mucous membrane of the vagina and of the neck of the uterus, and consequently the vaginal discharge may be tainted with that of the chancre. From 1831 to 1837 he performed 667 more inoculations with gonorrhœal matter, and from none of these did any chancre-ulcers result. Finally, Ricord proved that not infrequently the matter that exudes from the urethra is due to a chancre-ulcer situated in that canal, which upon inoculation produces a pustule from which a chancre will develop.

With these and other experimental researches all apparent contradictions were explained, and the independence of the gonorrhœal contagium was incontestably proved in every way, both as regards its indirect as well as its direct effect.

With the progress of science and more carefully observed clinical facts it soon became manifest that not all chancres were followed by syphilitic lesions. Hunter, who, although he looked upon gonorrhœa and ulcers on the genitals arising from sexual contact as the effects of one and the same poison, nevertheless maintained that not *all* the ulcers on the genital organs are of syphilitic nature. He only designated such ulcers on the genital organs chancre that were followed by syphilis. According to Hunter, the chancre was distinguished from all other sores on the sexual organs by a dense, hard, sclerotic base and by elevated indurated borders (Hunterian induration). All otherwise constituted non-indurated ulcers on the genitals were, in his opinion, not chancres; they were simple, ordinary, non-infectious ulcers or secondary syphilitic sores. These secondary syphilitic sores were said to be distinguished from the primary sores by the fact that they were not callous, did not spread rapidly, produced no adenitis, were not auto-inoculable, and healed rapidly. At first, Ricord made no distinction between the indurated and non-indurated ulcers, calling them both ulcerating chancres, and deeming both to be the effects of one and the same virus. He called the virus "chancre-poison or primary syphilitic poison," which in some cases—not, however, in all—is followed by syphilis, and which, according to the grade and phase of development, he embraced in the category of *secondary* and *tertiary* affections. Gradually, however, he approached the position held by Hunter, in so far as to admit that only that chancre which was situated upon a hard base, or left behind it a hard cicatrix, was capable of producing general syphilis, and such chancres he therefore called "infecting chancres." The induration thus established was looked upon as a criterion of commencing blood-poisoning. The reason why induration resulted in one case and not in another, he maintained, was not due to the difference in the character of the virus, but partly to its more or less weakened power to infect (virulescence) and partly to the difference of

tissue upon which it was implanted. He regarded the Hunterian or the infecting chancre merely as a variety of chancre-infection, and which is additionally distinguished from the other varieties by the fact that it occurs but once upon one and the same individual during his whole life. Finally, Ricord, like Hunter, held that the primary sore was the sole fountain of syphilis and denied the ability of secondary manifestations to transmit the disease from one person to another.

This theory of Ricord, which has been called the *unity* or *identity theory*, was soon shaken by experience, which conflicted with it. It was repeatedly observed that a person had *simultaneously* a soft and an indurated chancre *near each other*, that many persons had multiple contagious soft chancres, without being affected subsequently by syphilis, while in another person a single hard ulcer was followed by constitutional manifestations. Lastly, numerous confrontations of infected and infecting patients showed that the indurated ulcer was always produced by similar or secondary syphilitic ulcers of the person infecting, while a soft chancre, attended only by local symptoms, propagated through contact only a local sore which was soft in character. All these circumstances led one of Ricord's scholars, Léon Bassereau, in 1852, to establish the proposition that the soft chancre was *not* a source of syphilis. In conjunction with Clerc, another pupil of Ricord, he propounded a new theory, namely, the *duality theory*, by which he maintained the existence of two essentially different chancre-poisons—the soft and the indurated—both of which are indebted to two totally different contagions for their origin. The soft-chancre sore, he maintained, was always a local disease, and was only capable of acting perniciously upon the general system by causing suppuration in the adjacent lymphatic glands. But the hard chancre always led to blood-poisoning and constitutional symptoms. Though, to be sure, it likewise causes swelling of the adjacent lymphatic glands, they never or very seldom pass on to suppuration, and the pus they contain can not by propagation produce a chancre. This new theory of Bassereau and Clerc was soon adopted by Ricord and Fournier, and formulated in the law that each variety of chancre was only capable of propagating its own kind.

The soft chancre or chancroid may be produced by inoculation upon sound as well as upon syphilitically diseased tissues; the hard chancre can only be reproduced by inoculation upon healthy tissues, and never upon any that is already syphilitic.

Clerc, it is true, succeeded, by inoculations with matter from a hard chancre, in producing ulcers, which he designated by the name of "chancroide," and which he believed to be of a similar nature as the soft chancre. He therefore maintained that the soft chancre was a bastard product produced by inoculating a syphilitic person with an infecting chancre, which, if it were once developed, was capable of propagating itself in an endless series, without ever assuming the primitive character of an infecting chancre.

In Ricord's "Leçons sur le chancre" cases were, however, reported which were supposed to prove that Clerc's chancroids were capable of reproducing the infecting chancre and the infecting chancre a soft chancre, even upon an individual who is *not* syphilitic. In order to save the dualism theory that was now *apparently* tottering, Rollet, of Lyons, suggested the hypothesis that both poisons can be transmitted simultaneously, and the result of this transmission is a "mixed" chancre (chancre mulet), whose auto-inoculation upon the same or upon a syphilitic person would produce positive results. While the French physicians continued to entangle themselves by one-sided views of the forms of the sores in a labyrinth of contradictions and names, other investigators deeming the contagions that formed the basis of the ulcers to be of prime importance, and supported by experiments as well as by exact clinical observations, were soon able to throw new light upon the action of the soft chancre and of syphilis. The results of the researches instituted by Wallace, Waller, Reinecker, Lindemann, Daniellsen, Von Bärensprung, Hübbener, Lindwurm, Hebra and Rosner, Pelizzari, H. Zeissl, and many others, together with our own clinical experience, enable us to lay down the following principles:

1. The poisons of the soft chancre and of syphilis are totally different from each other. They have only in common the external quality that both of them are most frequently con-

tracted during sexual congress; hence soft chancres, like primary syphilitic lesions, are more often found upon the genital organs of both sexes.

2. The pus and tissue détritus, disorganized by the chancre-infection, are the vehicles by which the poison of the chancre is conveyed. The virus of syphilis is united especially with the disorganized détritus of the syphilitic inflammatory product, and also with the blood, and probably with the semen of syphilitic persons. The experimental inoculations performed with the blood of syphilitic patients produced positive results in some though not in all cases. Why all syphilitic parents do not beget syphilitic children is still unexplained.

3. Pus from an abscess or the contents of a non-syphilitic eruption on a syphilitic person, when transmitted to a healthy individual, have not hitherto, in our experiments, produced syphilis.

4. The poison of a soft chancre reproduces itself, if transmitted upon a syphilitic person, in the same manner as in a healthy one. The discharges from a soft chancre situated upon a syphilitic individual will always produce a soft chancre only.

5. If the secretions of a suppurating specific primary lesion are inoculated upon its possessor or upon another syphilitic person, there results upon some of the luetic (syphilitic) patients so inoculated an ulcer; but this ulcer need not necessarily be a primary specific ulcer, because a person who is already luetic can not while he is still syphilitic again acquire syphilis. We maintain the correctness of the proposition that a primary syphilitic lesion, as such, can not be reproduced upon its possessor.

6. The minimum quantity of blood-particles which is apt to be present in a chancre of a syphilitic person is not capable of producing syphilis. But if syphilitic inflammatory products, such as papules or nodules, are made to undergo suppuration and disorganization by implanting upon them chancroid virus, a pustule may be produced, and if this détritus be then inoculated upon a non-syphilitic person, an initial syphilitic primary sclerosis or hard chancre will develop.

7. Little as the purulent sputum of a syphilitic person when transmitted to a healthy person can produce in the latter syphi-

lis, so little will the pus of an abscess or the contents of a non-specific eruption from a syphilitic patient produce syphilis upon a healthy individual. Only the pus or the structural *débris* of the products especially belonging to syphilis is capable under favorable circumstances of producing syphilis. The supposition of the existence of a mixed chancre, in the sense advocated by the Lyons school, we have discarded long ago. To be sure, we have to admit that the secretion of a soft chancre, if implanted upon a syphilitic eruption, will exercise its destructive action in the same way as upon perfectly healthy tissues; but if the disorganization of the syphilitic eruption through the chancrous virus has once been established, the resulting ulcer will then have nothing in common with the soft chancre. Now, if the pus of an inflammatory syphilitic product—for instance, a syphilitic papule brought to the stage of suppuration by irritating it with the secretion of a soft chancre—is implanted upon a healthy person, syphilis will be produced; while the same soft chancre if inoculated upon a syphilitic individual at any place that is unaffected by syphilitic inflammatory product will occasion a soft chancre only; and this, again, if inoculated upon a healthy person, will give rise to a soft chancre only, and produce no syphilis.

8. The syphilitic primary effect or lesion may appear in three forms: First, as a superficial erosion or deep ulcer with hard borders and hard base; second, as a hard nodule or kernel, which in the progress of the disease breaks down; and, third, as a hard nodule, that from its origin to its complete resolution shows not the least trace of breaking down. *The syphilitic primary lesion* is the first manifestation of *general, constitutional syphilis.*

9. The most important data of the syphilitic primary lesion are the peculiar cartilaginous hardness, whether the syphilitic chancre appears as a simple nodule or as a hard ulcer; next, the indolent swelling of the lymphatic glands that accompanies it and the scanty suppuration.

10. If a syphilitic person is inoculated with ordinary pus or any other irritating fluid, upon an incision made with a clean vaccinating-lancet, there will sometimes result, in consequence of this irritation, a syphilitic ulcer.

11. There is no chancrous syphilis, no primary and no secondary syphilis. It is only proper to speak of chancre-syphilis when it is desired to indicate that the chancroid poison was mixed with syphilitic poison. The Hunterian induration may indeed be looked upon as the first manifestation of syphilis that is about to develop, but is by no means to be regarded as a primary evil whose virus in the course of absorption will become converted into the so-called secondary syphilitic virus.

To the principles enunciated under § 5 we must add a few words and also refer the reader to the chapter on the "Inoculability of the Indurated Ulcer," which will be found further on.

It is an irrefutable fact that it is possible, by inoculating a luetic individual with syphilitic pus and syphilitic ulcer-détritus, to produce pustules and ulcers. Now, the question arises, What is the nature of those ulcers, which Clerc, for the sake of brevity, styled "chancroides," and what happens if a healthy person is inoculated with one of them? Before we answer these questions, we have to premise a few remarks. It has been ascertained, through experiments made by many physicians, that even the pus from ordinary skin-disease—for instance, a pimple of the face—may in some cases be used for repeated auto-inoculation on healthy persons. In this way the principle of the greater vulnerability of the skin of a syphilitic person was partially refuted, and we must restrict ourselves to the statement that we can obtain positive results in some cases by inoculating healthy persons with any kind of pus, but that such inoculations take effect more readily in syphilitic persons. It is, therefore, easy to comprehend why we can so often produce ulcers by inoculating syphilitic persons with the pus of a syphilitic eruption. The question next arises, What happens when we inoculate a *healthy* person with matter taken from such a "chancroid"? The result may be of three kinds: First, the inoculation may not take; or, second, an ulcer ensues which remains localized; or, third, a syphilitic primary lesion develops, followed by consecutive general syphilis. Why an inoculation fails we are unable to explain. The second and third conditions we consider as explicable in this wise: The syphilitic contagium is not chemically soluble, and

is not uniformly distributed in the blood. Now, if we bear in mind Chauveau's experiments with vaccine lymph, we can assume the following facts: That in vaccinating we only transmit lymph and such particles of matter which accidentally contain no syphilitic virus. In this case, if the vaccination takes, we will only produce a simple local ulcer, which does not bear the characters of a syphilitic primary lesion. But if we transmit pus and such particles as do contain syphilitic virus, we will, in the third case, produce a syphilitic primary lesion that will be followed by general, constitutional syphilis. The vaccinated sore that remains localized may be compared to the inoculated ulcers, which may be produced on luetic and healthy persons with ordinary pus, and which may be reproduced by repeated inoculations. But if it is intended to regard these inoculated ulcers as soft chancres, then every inoculated ulcer produced with any kind of matter would have to be considered as soft chancres—a statement which we are not yet inclined to make.

From what has here been said, it is evident that we must adhere to the duality doctrine of Von Bärensprung and H. Zeissl, and consequently assume the existence of three venereal poisons, namely, the *contagium of gonorrhœa*, of the (soft) *chancre*, and of *syphilis*. We will first discuss the morbid processes of gonorrhœa, then the soft chancre, and lastly syphilis.

SECTION I.

GONORRHŒA (TRIPPER), VENEREAL CATARRH.

The morbid process known as gonorrhœa is a catarrh of the urethral mucous membrane. With the word catarrh, however, only *one* symptom—namely, the hypersecretory activity of the affected mucous membrane is brought into prominence. Every hypersecretion presupposes the presence of a hyperæmia. This hyperæmia, in the vast majority of cases of gonorrhœa, is very active, because, as a rule, it is the immediate consequence of a pathological irritation. However, mucous membranes in general, and the mucous membrane of the male urethra in particular, are exceedingly sensitive to morbid irritation. But, as is known, there are also stasis-catarrhs in which the hyperæmia is passive in character, and consequently comes on very gradually. The immediate effect of hyperæmia is a serous transudation into the mucosa and the submucous membrane (œdema of the mucosa), and an increased activity of the secretory powers of the mucous follicles, which produce a clear serous fluid (serous catarrh). Still another effect of the hyperæmia is an increased formation of epithelial cells and the production of mucus (epithelial and mucous catarrh). When the irritation of the tissues is very slight an increased formation of epithelial cells only will ensue; when it is somewhat severer but still moderate, the production of mucus becomes notably increased. But the increased flow of mucus does not only emanate from the open, patulous acinous glands, but also from the epithelial cells of the mucous membrane, whose protoplasm becomes transformed into mucous substance (mucous metamorphosis)—a procedure that has its analogy in the corneous transformation of epidermis-cells. If a still more

intense irritation takes place, the epithelial cells will form pus-cells either through endogenous cell-formation or nuclear fission, and the cavities of the follicles are filled up with a fluid containing pus-cells (inflammatory and purulent catarrh). As a result of the continued suppuration, many of the affected follicles are liable to undergo ulceration, which may involve the submucous tissue, and result in limited defects of the mucous and submucous tissues (catarrhal ulceration).

Now, just as we may speak of a serous, epithelial or mucous, and purulent catarrh, so is it possible to differentiate between a *serous*, *epithelial* or *mucous*, and *purulent gonorrhœa*. The distinction, however, between these forms can not be strictly maintained. In all forms of catarrhs, just the same as in gonorrhœa, more or less epithelial cells, mucous and pus corpuscles may occur together; one or the other of these three elements may, however, preponderate in a given case, and thus establish the character of the secretion.

The serous, epithelial, and mucous catarrhs, as regards gonorrhœa, are the forerunning stages of the purulent catarrh of gonorrhœa. The disease may be arrested at any one of these stages by any inhibiting influence; or, on the other hand, the inflammatory and purulent catarrh of gonorrhœa in its retrograde development may undergo resolution from stage to stage to the mucous, epithelial, and serous form.

If the pressure of the blood in the capillaries of the catarrhally affected mucous membrane becomes so great that they rupture, capillary hæmorrhage will ensue. The escaped blood-corpuscles cause the purulent discharge to become brown or black in color, and the bleeding mucous membrane to assume an inky appearance (the black or Russian gonorrhœa).

All the phenomena described above which go to make up the anatomical symptom complex of a catarrh in general, and hence, also, of the venereal kind, undergo in the latter especially a rapid transformation, so that the whole morbid process runs its course in a few weeks and the mucous membrane may again be restored to a perfectly normal condition (acute gonorrhœa). Before, however, the mucous membrane again becomes perfectly normal, it remains sensitive for a long time and the least cause may reproduce the catarrh. These relapses may

recur very often, and their frequent repetition tend to render greater the disposition to contract new catarrhal attacks; these relapses always last longer too. Through the recurrence of frequent relapses the morbid condition is apt to become permanent (chronic gonorrhœa).

The views now prevailing concerning the genetic factors of gonorrhœa are not very clear. At any rate, it is an undeniable fact that the disease may be transmitted from one person to another. The question, therefore, arises whether the transmission can be explained by the fact that the morbific action of the secretion of gonorrhœa develops its irritating properties in the usual manner in the second individual, or whether the gonorrhœal secretion possesses a peculiar specific power by virtue of which it infects.

While some investigators look upon the morbid process of gonorrhœa as a result of ordinary irritation of the mucous membrane, others claim that it is produced entirely by a contagion, which is reputed to possess such intense power that it can act not only by indirect contact but also at a distance (aura gonorrhœa).

In regard to the hypothesis, that any irritation of the mucous membrane, be it mechanical or chemical, is capable of producing a muco-purulent secretion, it is a fact that has been a matter of daily observation for a long time. Through simple friction of the vulvar mucous membrane (manustupration), the frequent introduction of instruments (bougies or catheters) into the male urethra, the impaction of calculi *débris* in the latter canal, the wearing of pessaries in the vagina for a length of time, catarrh of the mucous membrane of these organs has frequently been produced. Swediaur engendered an obstinate discharge from his urethra by injecting it with ammonia. Osmic acid, when placed upon a mucous membrane, will produce catarrh upon it; even the vapor of the acid is capable, as is well known, of causing serious catarrhal irritation of the conjunctiva palpebrarum et bulbi and of the mucous membrane of the larynx and trachea. The decomposing secretion of the glans penis, containing as it does ammonia, may occasion blennorrhœa of the glans penis. The decomposing menstrual blood, the lochia, discharge from a cancer, a chancre in

the urethra, all may induce a hypersecretion of the urethral follicles. The catarrhal hyaline secretion of the uterus, under certain conditions, will give rise in some men to a muco-purulent discharge from the mucous membrane of the urethra.

As every catarrhal secretion may become aggravated into an inflammation attended by suppuration, it was supposed that the growth of the infecting power of the secretion kept pace with the growth of the catarrhal process till it became aggravated into a purulent condition. Some authors, therefore, maintain that the gonorrhœal discharge only becomes infectious when it has become purulent; that the serous secretion during the prodromal stage and the mucous secretion during the stage of resolution, if they contain no pus-cells, possess no infectious properties. In our practice, however, we have seen numerous instances where men troubled only with the prodromal phenomena of gonorrhœa, i. e., a prickling sensation at the meatus urinarius, where not a trace of pus could be found in the urethral discharge, infected their wives and mistresses. We have likewise had the experience that the slight mucous secretion of gleet is capable of communicating a gonorrhœal disease.

The facts here produced compel us to assume that the morbific potency of a gonorrhœal infection is not to be found in the pus-cells, but in a specific catalytic power of the secretion —i. e., in a contagion which adheres to the epithelial as well as the pus cells, and which we are not able to isolate any more than other kinds of contagium. The hypothesis that an animal or vegetable parasite (Neisser's gonococcus) forms the basis of a gonorrhœal contagium has not yet been satisfactorily demonstrated.

[This gonococcus, which Neisser discovered in 1879, he claims occurs so constantly in the pus of gonorrhœa, that he and other investigators were led to consider the virulency of the disease as being due to this micro-organism. This proposition was subsequently confirmed by the successful inoculation of a pure culture of gonococcus. The gonococci are distinguished by their relative size, and also by usually occurring in groups of two, four, and more couples, whose origin may be

recognized by the division of the primitive coccus. These cocci are flat on the surfaces, facing each other like "split peas," and the groups formed of two or more couples are like German rolls facing one another. This marked tendency to form groups that consist of numerous pairs of single cocci, distinguishes this from other kind of cocci, which may happen to be in the urine and discharges from the sexual organs, and which likewise occur in the form of diplococcus, but never constitute such large groups.

The gonococci are found in the pus, some of them free and others upon and probably also in the epithelial and pus cells, but not in the granules. By examining a prepared section of the conjunctiva of an infant afflicted with blennorrhœa neonatorum, Bumm proved that the gonococci are only capable of penetrating cylindrical and not flat epithelial cells, that they penetrate down between epithelial cells, but reach only the topmost layer of the submucosa, sometimes arranged as if they followed the capillaries of the lymphatic vessels.]

True, it is now generally admitted that there must be a gonorrhœal contagion, because daily experience has shown that a minimum quantity of gonorrhœal discharge is sufficient to morbidly affect a normal mucous membrane, as is often the case in the production of gonorrhœal conjunctivitis. According to the views of most experienced physicians, catarrhal secretions of *other* mucous membranes are also more or less contagious. We are, therefore, of the opinion that there are *irritative catarrhs*—i. e., catarrhs that may be produced by various irritants, chemical agents, and disorganized physiological and pathological secretions, and such catarrhs as are produced by a specific contagious matter, and which should be designated as purulent or *virulent* gonorrhœa. Although the irritative catarrh is pre-eminently attended by a muco-epithelial secretion, still one is not justified, from this property of the secretion, in saying that its genesis is *not* virulent, because a mucous catarrh may be the beginning and end of one that is virulent. In regard to the prognosis, however, we can say that the mucous catarrh, as a rule, is irritative, and its cure much easier to effect than the other forms.

Site of the Gonorrhœal Affection and Mechanism of the Gonorrhœal Infection.

Venereal catarrh mostly affects the mucous membrane of the genital organs of both sexes; but it may also be conveyed by contiguity to the mucous membrane of the rectum and uterus, and by transportation of the secretion to remote mucous membranes—for instance, the conjunctiva. Venereal catarrh most frequently occurs upon the mucous membrane of the male urethra, and the vagina and vulva in the female; less frequently the cervical canal of the uterus, and rarer still the female urethra, are involved. We have never had an opportunity of seeing gonorrhœa of the nose and mouth.

It is easy to conceive why the female vagina and vulva and the glans penis should by contagion become catarrhally affected. The morbific matter readily comes in contact with the genital parts during coitus. Less easy to comprehend, however, is it how the morbific agent can, during copulation, exercise its influence upon the mucous membrane of the male urethra, the meatus being but a narrow slit, whose lips well-nigh close the opening of the urethra hermetically. We opine the *modus operandi* to be as follows: The external orifice of the male urethra during the act of coition, by the forcible intrusion of the membrum virile (erect penis) into the vagina, is mechanically slightly opened. By the separation of the lips a vacuum occurs, and by the laws governing such physical conditions a portion of the contagious and irritative fluid that happens to be in the vagina is sucked into the urethra and effectively retained there, because during the retraction of the organ that follows the lips of the meatus are closed again. That this explanation is correct is proved by the following facts: Of several men who successively copulate with the same woman, those will not become diseased who on account of their intense excitability ejaculate their semen when their membrum virile has barely been introduced within the vulva. Men who break off the act of coition before ejaculating the semen become affected sooner than those who complete it naturally yet quickly. Men who micturate immediately after copulating are less often affected than those who do not take that precaution.

The spermatic fluid during ejaculation, and the urine during micturition, seem to wash out the urethra from behind forward in a similar manner.

Factors that usually favor Gonorrhœal Infection.

Short acts of coition frequently repeated, and abruptly broken off, favor gonorrhœal infection, because, as the orgasms become longer, the female genitals become more irritated and incited to discharges. Hence it happens that copulation repeated at frequent intervals with a woman suffering from uterine catarrh, or one who is menstruating often, produces serous, epithelial, or mucous gonorrhœa in the male. If the catarrhal uterine secretion and the menstrual blood, *per se*, were capable of acting as irritants, the number of urethral catarrhs would be far greater. Even healthy, loving couples very often show, after a night of immoderate indulgence in sexual intercourse, the symptoms of commencing urethral and vaginal catarrh.

The relative size of the genital organs is also a factor that should be taken into consideration here. The greater the friction which the vagina must suffer from a large membrum virile, the more profuse and thicker will the catarrhal secretion be. A short, erect penis will scarcely ever be affected by a uterine secretion.

Men with large meatuses become diseased more easily and quickly than those who have a very narrow orifice. A urethra terminating in a hypospadic meatus is oftener and more easily infected than a normal one, because the gonorrhœal secretion of the vagina, in accordance with the laws of gravitation, accumulates mostly upon the posterior wall of the vagina, and consequently the contact of the urethral orifice of the hypospadiac with the infecting and irritating matter occurs more readily.

Another factor that favors gonorrhœal infection is drunkenness, because the act of copulation when attempted by a person in an intoxicated condition will take a longer time before terminating in ejaculation, and the membrum virile is consequently retained longer in the vagina.

A man who has but recently recovered from an attack of

gonorrhœa is much more readily infected than one who was not affected with the disease.

There is no peculiar condition of the blood that will render a person especially prone to be affected with the gonorrhœal contagium.

Gonorrhœa of the Male Urethra.

We make a distinction between serous, mucous, or epithelial and purulent catarrh of the male urethra. The cause, or circumstance, which in a given case produces a serous or mucous catarrh only, and stamps it with that character, consists mainly in the property which the morbific matter exercises upon the urethra. Upon that also depends the rapid or tardy development of the catarrh. The richer the morbific matter is in pus the quicker will the disease ensue, and the more intense will it be. Mucous secretion, for instance, catarrhal uterine discharge, or fluids entirely free from pus, like menstrual blood, or mechanical irritation of the urethra, as a rule give rise to serous, epithelial, or, at the most, mucous catarrh, while the purulent discharges of inflammatory catarrh of the urethra and vagina generally cause an inflammatory or purulent catarrh.

The serous and mucous catarrh of the male urethra is either *initial* or *terminal*. The initial catarrh soon subsides under an appropriate treatment; under unfavorable circumstances, however, it will merge into an inflammatory or purulent catarrh. The terminal catarrh, as a rule, assumes a protracted course, and is exceedingly obstinate. The initial serous and mucous catarrh has its site in the fossa navicularis of the urethra, the terminal catarrh in the pars membranacea and prostatica. The secretion of the terminal serous and mucous catarrh is frequently more opaque and glutinous than that of the initial catarrh, because, owing to its site in the pars prostatica, the tubuli prostatici are also involved. The secretion of the prostate gland produced in consequence of unnatural and prolonged sexual irritation, and which finds its way into the urethra, is not to be mistaken for the mucous discharge of the initial serous and mucous catarrh.

The *inflammatory* catarrh of the male urethra (urethritis purulenta, acute inflammatory gonorrhœa) runs its course in

the following manner: Twenty-four or forty-eight hours, seldom later, after an act of intercourse, the person feels a slight, unpleasant prickling sensation at the meatus which leads him to micturate frequently. Gradually, however, the mucous membrane of the meatus becomes swollen and a slight but clear translucent and tenacious secretion makes its appearance, which, under the microscope, shows mucous corpuscles and a few epithelial cells. If the patient is made to pass his urine into a glass vessel, the discharge will be seen to contain numerous flocculent and thread-like structures that swim about in the urine, which is otherwise clear. The discharge being slight, it therefore becomes inspissated in the meatus, sealing it up, thus preventing the patient from micturating easily. It generally requires a few moments before the thickened discharge is washed away by the stream of urine. These symptoms are met with alike in both the serous and mucous gonorrhœa. In purulent gonorrhœa, however, the scene is soon changed. The tickling is transformed into a burning, painful sensation. The mucous membrane of the meatus swells up so that it bulges outwardly and the orifice looks like the mouth of a fish. The secretion becomes more profuse, thicker, and acquires a greenish or yellowish-green color. If at this stage of the disease a small quantity of the urine is collected in a glass vessel, it will appear opaque on account of the purulent secretion that is mixed with it. The pus-corpuscles swim about like particles of dust or minute animalcules in the urine, and then gradually sink to the bottom of the vessel because their specific gravity is heavier than that of the mucous flakes and epithelial cells of the mucous catarrh and the urine itself. The discharge slightly colors blue litmus-paper red, and under the microscope shows predominantly pus-corpuscles along with mucous and epithelial cells, sometimes also a few blood-corpuscles. Virchow has called attention to the fact that gonorrhœal pus-corpuscles are larger than those of ordinary pus. The purulent discharge appears by the fourth or fifth day, rarely not until the twelfth or fourteenth. As the discharge from the anterior part of the urethra gradually increases, the difficulties of urination also increase. The patient micturates either with a good deal of pain, the urine coming away only in drops,

or in a thin, weak, and interrupted stream, because the urethra, owing to inflammatory swelling of the mucous membrane, is temporarily narrowed, and the smooth, striated, muscular fibers of the urethra that propel the stream of urine are partially paralyzed. Occasionally Wilson's muscle, the sphincter vesicæ, contracts spasmodically, causing intense strangury. The spongy portion of the penis, like the mucous membrane, is engorged; hence the organ is constantly in a semi-erect condition, and thus helps to render the urethra still narrower.

In cases of intense inflammatory gonorrhœa of the male urethra, gastric disturbances and febrile movement not infrequently become superadded. The former healthful appearance of the patient disappears as if by a blow, and he becomes pale and sickly-looking. This marked depressed condition of the general system is not, however, due to the effect of the gonorrhœal contagion upon the blood, but is the result of the constant pain and disturbed sleep. The warmth of the bed causes frequent erections, and the swelled mucous membrane not being sufficiently distensible is dragged upon by the erections of the corpora cavernosa, producing intense pains and disturbance of sleep at night. When the patient, despite the pain and utter exhaustion, finally falls asleep, he is not infrequently awakened by a painful emission.

The morbid phenomena here delineated persist for a longer or shorter period according to the dietary measures and regimen the patient keeps. Under appropriate measures the swelling of the urethral canal subsides by the eighth day, and the dysuria markedly diminishes. At the beginning or end of the third week the purulent discharge decreases and becomes poorer in pus-corpuscles, while the mucous and epithelial cells begin to predominate. Gradually the mucous discharge also changes, so that only a few drops of mucus or muco-purulent discharge escapes from his urethra if he has not micturated for several hours. If the urine that is passed at this time is collected in a glass vessel, whitish shreddy structures (gonorrhœal shreds), varying in length, are seen floating in it. If the shreds are taken from the urine they will contract into small gelatinous lumps, and microscopically are seen to be fatty degenerated epithelial cells and pus-corpuscles. These elon-

gated epithelial shreds may, it is true, originate in the ducts of Cowper's or Mery's gland; still they are not to be considered as such in all cases, since they may form at any point of the urethral canal. After a while, the quantity of these shreds diminishes, and for some time, whenever the patient urinates, there may be but one such shred in the urine. Finally, this one too disappears, and in the course of six weeks' time a gonorrhœal process may be said to have reached its end. So long as any of these gonorrhœal shreds is noticeable in the urine, the least cause may again start up the morbid process that is so near expiring. The oftener these relapses occur the more difficult is it to cure completely a urethral gonorrhœa. In some parts of the mucous membrane of the urethra permanent sensitive spots remain, attended by persistent though slight muco-purulent discharge. This condition is called gleet (after-clap) or chronic torpid gonorrhœa.

Chronic urethral gonorrhœa may best be described as a persistent mucous stage in the retrograde development of the disease. Here the discharge containing mucous and epithelial cells is very slight, and is only seen *at times*, especially in the morning, at the meatus of the urethra, or, by squeezing the parts, a drop of matter is expressed. If the lips of the meatus are not agglutinated, micturition is easy, and no general and often no local disturbances of sensation are present. In some cases, however, the patients complain of occasional prickling sensations in the region of the fossa navicularis or at some point of the perineal part of the urethra, or, again, of some transient stitches that extend from the latter spot to the anal opening. These sensations seem to be due to deep pathological alterations, which, however, vary so much that we are not justified in describing them under the common name of "chronic gonorrhœa"—still less so, as a more correct diagnosis would essentially alter the prognosis and treatment of the disease.

In acute gonorrhœa of the urethra the dysuria may, owing to the intense swelling of the urethral mucous membrane, become intensified into a condition of actual strangury. The turgescence of the capillaries of the mucous membrane may attain such a degree that they rupture at various points, sometimes resulting in severe hæmorrhage. The blood that is

poured out into the urethra and coagulates there colors the purulent discharge reddish-brown or even blackish, and for this reason it is also called *hæmorrhagic*, *black*, and *Russian* gonorrhœa, because it is said to have been of uncommonly frequent occurrence among the Russian troops engaged in the wars at the beginning of the present century, owing to indiscretion in the diet and hygienic regimen.

Another uncommon feature of the inflammatory urethral gonorrhœa in the male is that the inflammation of the epithelial layer penetrates through the mucous membrane and the submucous tissue and involves the spongy portion of the urethra, in the meshes of which, especially in those of the corpus cavernosum urethræ, one or more painful swellings, varying in size from a pea to that of a lentil, form. If these peri-urethral inflammatory foci form in persons who are afflicted with frequent erections that last some time, the erections already so painful become still more intense, because the spongy portion in which the infiltration has taken place not only can not keep pace in the erections with the other portions of the erectile spongy body, but actually hinder it from becoming erect, and cause it to curve like the bow of a violin. This kind of erections has been designated *chorda venerea* (chordee), because the patients claim that they have the sensation as if the penis is prevented from becoming erect by a tense cord drawn through the urethra. Now, in its erections the penis will be bent either downward or to one side, according as the corpus cavernosum or urethra is affected. Under judicious treatment the pains during erections cease in the third week, and the peri-urethral inflammatory nodes undergo absorption. If the absorption is incomplete, the inflammatory exudative hypertrophies will remain, causing the affected spot of the spongy body to become obliterated, and during erections the member will curve toward the swelled spot, rendering it difficult of introduction into the vagina during intercourse. In some cases abscesses form in these peri-urethral infiltrations, which subsequently perforate the urethra and give rise to fine fistulous tracts. These abscesses most frequently break into the fossa navicularis in consequence of the inflammatory exudation occurring in the sulcus coronarius near the frænum.

In chronic gonorrhœa the catarrhal process may likewise, through indiscretion in diet or other injurious measures, become aggravated. The mucous catarrh becomes intensified into a purulent one, or even attains to a condition of croupous inflammation. This manifests itself in the following manner: The patient whose urethra is apparently almost well suddenly begins to feel intense itching in the perineal region, and this sensation is supplanted in a few hours by violent pains. The mucous discharge subsides almost entirely, but there is greater difficulty in making water, and the stream of urine becomes thinner. If a bougie is introduced, and after its removal a syringe full of water is injected, the returning fluid will bring away white membranous masses from two to three centimetres in length, consisting of a dense band-like or cylindrical fibrinous substance which has originated by fibrinous exudation upon the epithelial layer of the mucous membrane. These bands will break abruptly on being forcibly stretched. On the addition of acetic acid they swell up and become clear like fibrine, whereas mucus becomes opaque and coagulates into shreds on the addition of an acid. According to our experience, this morbid condition seems mostly to be produced in the membranous part of the urethra in consequence of severe irritation by strong injections, especially solutions of bichloride of mercury.

Urethral gonorrhœa has its starting-point in the fossa navicularis. This is evident from the fact that at the beginning of the disease patients complain of an itching sensation, and later of pain in this region. But the physician should not hastily assume that the gonorrhœal process tarries in the fossa navicularis as long as the patient experiences tickling or pain in this locality. In this part of the urethra the sensorium commune of the entire territory of the genital organs seems to center, for here the patient feels all the morbid sensations, in whatever manner or part of the urinary organs they may have been produced. Thus, calculi in the bladder, affections of the prostate, and many other irritations, produced in the deeper parts of the urethra, are felt in the region of the fossa navicularis. At the beginning, during the initial serous or mucous stage, the congestion is certainly limited to the anterior part of the urethral canal; but after a few days, espe-

cially in purulent catarrh, the congestion gradually extends backward, so that by the eighth or tenth day the entire mucous membrane of the pars pendula, and by the beginning of the third week that of the pars membranacea, is affected. The junction of the pars bulbosa to the pars membranacea of the penis, where likewise a navicular fossa forms, and where a number of aggregated follicles exist, is the most difficult spot to cure —the follicular inflammation forming the greatest obstacle in curing a gonorrhœa radically. An inflammatory urethral gonorrhœa may be arrested at any point in its progress, from the fossa navicularis to the membranous portion, but at this point the disease is not only likely to become markedly aggravated because the existing follicles, that have been alluded to, become inflamed and undergo suppuration (gonorrhœal abscesses), but swelling and thickening of the tissues take place here preferably, which, if produced by stasis-catarrhs, will, according to the intensity, duration, and course, seriously affect the gonorrhœal process. But, from experience, we are justified in saying that certain constitutional conditions, such as scrofula, tuberculosis, anæmia, gout, rheumatism, hæmorrhoids, and all those irritations which, emanating from the rectum (intestinal worms) or bladder (calculi, etc.), are likely to affect the posterior part of the urethra, also contribute materially toward prolonging a chronic catarrh of the urethra, and make it exceedingly difficult to cure.

Pathological Alterations in the Male Urethral Canal produced by the Gonorrhœal Disease.

During the life of the patient it is not possible to see throughout the whole extent of the urethra, with the unaided eye, the morbid alterations of the mucous membrane of the urethra. Examinations on the cadaver seldom offer an opportunity of studying the morbid alterations of the urethral mucous membrane; and the views of most reliable investigators, based upon post-mortem research, refer more to such morbid lesions which have originated in consequence of a protracted chronic gonorrhœa than to alterations resulting from the acute form of the disease. The few cases of gonorrhœal disease which we had an opportunity of investigating

post-mortem, before the affection of the urethra had entirely disappeared, taught us that it only occasions such morbid changes as we are accustomed to find in catarrhs of other mucous membranes. The pathological alterations of gonorrhœa of the vaginal mucous membrane in the acute stage, or blennorrhagic affection of the conjunctiva palpebrarum et bulbi, will form the truest representation of the lesions resulting from the disease under consideration. We find there redness and swelling of the mucous membrane, sometimes granulations, and not infrequently erosions, which bleed easily. In regard to the gonorrhœal discharge, in the acute stage of the disease, proliferation of the epithelial cells and transformation of the epithelium-cells into pus-corpuscles take place, while in the torpid stage epithelial cells undergo fatty degeneration and hyaline cells abound. Rokitansky expresses himself thus: "The catarrhal inflammation of the urethral mucous membrane has a tendency to run a chronic course. It is either uniformly distributed over the entire urethra, or sometimes from the beginning, at other times later in its course, is limited to one or more spots. These inflamed spots are found at any part as far as the prostatic portion, but *most frequently at the fossa navicularis, and near the bulbous portion of the urethra.* They are recognized by their *dark-red color and the swelling of the mucous membrane;* sometimes, especially in the fossa navicularis, remarkable enlargement of *the mucous glands* and purulent collections are observed. At the same time the corpus spongiosum urethræ, at the places mentioned, in its innermost layer—at times, indeed, throughout its entire length —is swelled, and its meshes diminished in size, and consequently contains less blood. At these places an unyielding swelling, produced in the manner described, is readily perceived along the urethral canal. *The longer the inflammation lasts*, especially when its intensity is *frequently aggravated*, the less likely is it to get well entirely; it is more apt to terminate in thickening of the mucous membrane, or strictures." Engel is unable to say a great deal positively regarding the diseases of the urethral mucous membrane, because in most cases it is impossible to distinguish an acute inflammation of the urethra from the chronic variety. Neither produces

morbid lesions that are readily perceived or belong to them specially, and which are not likely to be met with in a condition of apparent health. And the discharge which in inflammation of other parts affords definite proof, is generally only limited in amount in urethritis—often, indeed, it is greatly diluted, changed, or washed away by the current of the urine, and in rare instances only is there any thick, purulent secretion.

The urethral mucous membrane generally becomes thickened, rough, and dry in chronic gonorrhœa. Occasionally there have been found in the region of the bulb, less frequently in the navicular fossa, spreading ulcers, one centimetre long, with flat, projecting shreddy edges and uneven bases surrounding the entire circumference of the urethra, studded with condyloma-like excrescences (carunculæ) and bridles of mucous membrane (Engel). They originate from the ulceration of the follicles found at those points, and in healing form white yielding or non-yielding cicatrices, according to the depth to which the ulcers have penetrated. In the fossa navicularis this ulcerative process may perforate the urethra, and a fistula may result, through which urine escapes during the act of micturition. To be able to diagnosticate a gonorrhœal ulcer in the living subject, pure water should be injected several times in succession into the urethra. If pus, mucus, blood-corpuscles, and especially structural détritus, come away after each injection, it is certain that an ulcer is present. Sometimes a bougie introduced into the urethra causes intense pain in passing over the ulcerated spot. In some cases we found the ducts of Cowper's glands dilated to such a degree that they allowed the passage of fine probes.

In the last decade the morbid lesions of the urethra, resulting from various diseases, have been studied by direct ocular inspection.

Désormeaux, as far back as 1853, used a complicated instrument for that purpose, which has since been considerably improved by several surgeons. The simplest apparatus was invented by Grünfeld. His instrument consists of an endoscopic tube and a concave mirror ordinarily used in laryngoscopic examinations. Gas, petroleum, or sunlight may be made available for illumination.

The "endoscope," so warmly recommended and employed by Grünfeld, is simply an endoscopic tube. It consists of a cylindrical metallic or hard-rubber tube, whose ocular end is dilated like a funnel, its inner surface blackened, and its visceral end open and polished smoothly. This tube is introduced by the aid of a conductor, and it not only serves the purpose of enabling the physician to obtain a view of the urethra, but also of applying remedies to it.

Great tact and practical skill in the use of sounds and catheters will help one to employ the endoscope successfully. The instrument is introduced armed with the conductor, pushed into the deepest part of the urethra, when the conductor may be withdrawn; the urethral surfaces may then be cleansed of mucus, discharges, etc., either by a plug of cotton-wool upon a wire, or by a stream of water from a long-nozzled syringe.

Three things are to be noted, according to Grünfeld, in making examinations by the aid of the urethroscope: 1. The funnel, i. e., the shape under which the urethral mucous membrane presents itself, wherein the larger end of the funnel lies contiguous to the internal border of the tube, and the narrow end is directed toward the smaller lumen of the urethra; 2. The central figure, i. e., the apex of the funnel corresponding to the point in the center of the field of vision, which is occasioned by the urethral walls meeting at a point; and, 3. The urethral walls, the color and thickness of the mucous membrane, the condition of its vascular arrangement, its reflex sensibility, etc.

Grünfeld distinguishes the following forms of acute gonorrhœa: 1. Urethritis blennorrhoica; 2. Urethritis membranacea; 3. Urethritis simplex; 4. Urethritis granulosa; 5. Urethritis trachomatosa; and, 6. Urethritis phlyctænulosa or herpetica. In *urethritis blennorrhoica* the field of vision is profusely covered with pus. The funnel form is absent, the central figure is irregularly indented, or a single spot is seen from which two or three indentations radiate. The swollen mucous membrane that bulges up into the lumen of the tube is uniformly livid in color, and presents defects of reflection corresponding to the punctated losses of substance. The edge of the tube produces in the thickened mucous membrane a temporary grooved

impression, and the mucous membrane bleeds on the slightest pressure. In *urethritis membranacea*, Grünfeld found the morbid process limited to a certain part, to which the pus firmly adhered, the removal of which caused bleeding. Parallel with the axis of the urethra several gray or grayish-white strips of exudation were found firmly adhering upon the mucous membrane. In *urethritis simplex* there is often present only a hyperæmic condition. Where the mucous membrane is somewhat more swollen, it will be found more reddened, and several bleeding points will also be detected. In *urethritis granulosa* a small quantity of muco-pus is found in the middle of the field of vision, resembling the point of the central figure, the funnel is short, the center figure oval and slightly shorter, the reflex irregularly triangular, the mucous membrane of a uniform velvety redness, with a few solitary punctate elevations. The mucous membrane, in the majority of cases, acquires a certain degree of rigidity, as may be perceived from the gaping of the walls at the central figure. In some cases Grünfeld observed a purely granular trachomatous swelling. In the forms of urethritis attended by ulcerations, *urethritis phlyctænulosa* or *herpetica*, Grünfeld found a few small circular ulcers which attracted attention by their color and sharply defined edges.*

Morbid Phenomena which occur as Co-effects and Sequelæ of Urethral Gonorrhœa in Men.

In gonorrhœal disease of the male urethra, certain morbid alterations often coexist which have their site beyond the territory of the urethra and its adjacent parts, and which may be regarded as the co-effects of the urethral disease, while the propagation of the disease may give rise to certain morbid lesions in contiguous or adjacent organs or parts of organs. Among the co-effects we may mention balanitis, affections of the lymphatic vessels of the penis, inflammation of

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* If the student desires further information upon this subject, he is referred to the work of Grünfeld, "The Endoscope in Diseases of the Bladder and Urethra," published in the "Deutsche Chirurgie," and to Grünfeld's treatise, "The Endoscopic Examination of the Urethra," in our work on "Syphilis," fourth edition.

the inguinal lymphatic glands, condylomata (warts), and certain rheumatoid affections of the joints, sheaths of muscles, and bursæ.

Of the diseases which extend by contiguity from the urethra to adjacent organs, we may mention affections of Cowper's gland, of the epididymis, prostate, bladder, ureters, and kidneys. Moreover, the morbid lesions produced by urethral gonorrhœa, when they supervene upon a severe form of the disease, are generally considered as accompanying phenomena of the disease; while those lesions produced by gonorrhœa of the male urethra and coming on some time after the urethritis was apparently cured (strictures of the urethra, prostatic and vesical diseases), are described as sequelæ.

Prognosis of Gonorrhœa in the Male.

Gonorrhœa of the male urethra affords a less favorable prognosis than gonorrhœa of the female urethra and vagina—a fact that might be inferred, even after leaving out of consideration certain co-effects which naturally can not occur at all in the female, but which in addition seem to be due to a higher function of the epithelial cells of the male urethral tract that has not yet been fathomed. To foretell the duration and course of a male urethral gonorrhœa is a difficult problem. Experience has only taught us so far that, when a mucous gonorrhœa has retained this character for several days after exposure to infection, it will under an appropriate treatment disappear sooner than a purulent gonorrhœa. This presumption of a speedy cure becomes almost a certainty when the female who communicated the disease to the patient suffers only from a mucous catarrh of the genital organs, or when the disease in the man can be ascribed to the temporary irritative influence of the menstrual flow in the woman. The first inflammatory gonorrhœal urethritis of a person is generally severer and more obstinate than the following ones of the same character. The shorter the intervals between the first inflammatory gonorrhœa and those following, the milder will the latter be. The greater the swelling and the eversion of the lips of the meatus, the more severe the disease may be expected to run. Hæmorrhages, peri-urethral inflammatory exudations,

infiltrations into one of the spongy bodies, affect the prognosis unfavorably. The healing of ulcerations takes a long time, and even a mucous catarrh of the deeper part of the urethral canal is very slow in getting well. A croupous gonorrhœa causes shrinking and contraction of the affected part throughout its whole extent. Lastly, hæmorrhoidal conditions, scrophulosis, and especially pulmonary tuberculosis, tend to delay the cure of a gonorrhœa in the male for a long while.

Prophylaxis against Gonorrhœa, and Treatment of Acute and Chronic Gonorrhœa in Men.

Up to the present day we have not succeeded in finding a medicinal agent by the use of which, before or immediately after sexual intercourse, a gonorrhœal infection may be prevented. According to Diday's and our own experience, injections with a solution of potash considerably diluted, or with slightly acidulated preparations, indeed even with pure water, directly after coitus, have a decidedly irritating effect; we would therefore recommend that such injections be not used till the membrum virile has been cooled off in a topical bath of cold water. The best security against contracting the disease is afforded by the use of the condom, made of various substances, such as the intestines of sheep, fish-bladders, and India-rubber. Owing to the frequency with which these envelopes burst, they can not be relied upon as a sure protection. As prophylactic measures which may possibly prevent the origin of the disease, the act of coition should be accomplished as quickly as possible, and should not be repeated at short intervals; the individual should abstain from having intercourse with menstruating women or those suffering from lochial discharges, and finally he should urinate directly after copulation and wash or bathe the penis in water.

Inefficient as our measures are to prevent a gonorrhœa, so little are we at present able to *abort* the disease by treatment. Injections of caustic preparations—for instance, strong solutions of nitrate of silver (1 gramme to 30 of water [= gr. xvj to ℥ j]) before the inflammation has begun to develop, as recommended by Ricord—may prove positively injurious to the patient and never afford any benefit. Indeed, all kinds of

caustic injections are apt to produce sloughing of the urethral mucous membrane, inflammation of the neck of the bladder and of the prostate gland, hæmorrhage from the urethra, and the disease which the physician sought to nip in the bud will be vastly protracted and aggravated. In regard to large doses of balsamic remedies administered internally, with the object of aborting the disease, we hold that they merely give rise to severe digestive disturbances, without exercising any beneficial effects whatever.

Hence we are only able to recommend a *methodical* treatment of urethral gonorrhœa corresponding to the intensity and the stage of the disease. The more intense the inflammatory phenomena and the discharge, the milder should the treatment be; the milder the inflammatory symptoms, the more energetic, but not too energetic may the treatment be. If the treatment adopted consists in the introduction of remedies and medicated instruments into the urethra, it is called the *direct* method; but if a cure is attempted by the action of remedies through the digestive and respiratory organs, it is known as the *indirect* method.

It is of the utmost importance to regulate the diet and regimen of the patient. Whether the patient suffers from an acute or chronic gonorrhœa, he should be prohibited from drinking beer, wine of all kinds, champagne, and soda-water. In sensitive individuals these beverages may occasion dysuria, bleeding, and other symptoms denoting aggravation; these unfavorable complications are likely to supervene in gonorrhœa, even without any special causes. The patient should likewise be prohibited from using asparagus, celery, and all other articles of diet which stimulate the urinary organs or cause erotic sensations. Active exercise, such as running, riding, fencing, playing billiards, etc., should be prohibited, and as a measure of precaution the patient should be advised to wear a suspensory bandage with thigh-straps. Suspensory bandages with elastics which press upon the urethra are injurious and should not be used.

Notwithstanding these precautions, the patient is not safe from an attack of inflammation of the epididymis. He is, of course, to abstain absolutely from sexual intercourse; a single

indulgence at this time is likely to produce the most injurious results, and a simple gonorrhœa may become gravely complicated. The best drink is, after all, pure water; at the most, lemonade in quantities only sufficient to quench the thirst may be allowed. Diuretics are directly injurious. In regard to his food, the patient should be kept on a spare diet, consisting if possible exclusively of vegetables, milk, light tea and mild coffee, chocolate, soups, and stewed ripe fruit. If meat has to be permitted, it should only be in small quantity and at noontime. The patient should eat nothing late in the evening or shortly before retiring, in order to avoid seminal emissions. Were the gonorrhœal patients to subject themselves to the above-described diet and remain strictly at rest, and in addition make daily applications of cold water for several hours to the genital organs and perinæum, *most cases of gonorrhœa would get well within four or six weeks* without injections or internal medicine, or at the most with the aid of very little medicine.

If the patient, in the course of an acute or chronic gonorrhœa, is obliged to urinate frequently, or if blood is ejected with the last few drops of the urine, no injection should be made into the urethra nor any balsamic remedies administered internally. The frequent ischuria and the discharge of blood from the urethra or bladder are best relieved by the application of hot fomentations to the region of the bladder and over the penis and perinæum, by the introduction of suppositories of belladonna or morphine into the rectum, or the internal use of both these remedies or of extract of cannabis indica. Iron and ergotine may be employed if the hæmorrhage continues or is severe. For this purpose we prescribe:

℞ Extract. belladonnæ (or morph. mur.), 0·10 [= grs. jss.];
Butyri de cacao, q. s.;
ut. ft. suppositor. parva No. 10.

S. Three suppositories, well oiled, to be introduced daily into the rectum.

℞ Ext. cannabis indica;
Ext. semin. hyosciam., āā 0·30 [grs. v];
Sacchar. alba, 3·00 [grs. xlvij];
Div. in dosis No. X.

S. One powder to be taken every four hours.

℞ Liquoris ferri sesquichlor. soluti, 1·50 [gr. xxiij];
Aqua destil., 100·00 [℥ iii, ʒ ij, ℈ ij];
Syr. rubi idaei, 20·00 [℥ ss., ℈ iv];
S. One tablespoonful every hour in water.

℞ Carbonatis ferri saccharat.;
Ergotini pur, āā 1·00 [gr. xvj];
Sacchar. alba, 3·00 [gr. xlviij];
Div. in dosis No. 10.
S. Four powders to be taken daily.

In very intense dysuria and very painful erections, the hypodermic injection of morphia into the perinæum will afford prompt relief.

[For the control of the ardor urinæ, alkalies, such as acetate of potash, with spirit of nitri dulcis and camphor-water, may be given, diluted in water, every three or four hours.

In the acute stage, when the chordee is very severe, an injection of cocaine before going to bed, and another when the patient is attacked by it in the night, have rendered the best results. In some cases the cocaine answered admirably when all other agents failed.]

No favorable effects are derived from the internal administration of camphor. If the bleeding from the bladder does not cease under this treatment, cold-water applications should be substituted for the hot fomentations; but the former should be discontinued if they aggravate the pains on micturition. If no dysuria be present, and the penis is not much swollen, injections may be ordered at once, but if painful urination or pain in the testicle ensue, the injections must be immediately discontinued, and the remedies above recommended for the dysuria, or the measures to be described in the treatment of epididymitis, may be resorted to. When no great amount of swelling of the penis, in consequence of the inflammation of the urethra, is present, injections may be begun. But the remedies to be injected must not be too strong or too concentrated; they should have no escharotic action, nothing more than an astringent effect. If the injections employed are of the proper strength, the pain from which the patient suffered during urination often subsides in from two to three days, and the discharge of pus also diminishes, while stronger injections

quickly aggravate the pains, the penis becomes swollen, frequent and painful urination and bleeding ensue, and the patient is rendered more miserable than ever. As has been remarked above, better results are obtained from mild astringent injections, employed at proper periods and in a proper manner, than from any other measures. And yet many objections have been urged against using them. The most serious are that by the injections the contagious discharge is forced farther backward into the deeper parts of the urethra, and the inflammation is consequently driven into the testes and bladder; furthermore, that astringent or caustic injections accomplish nothing more than spasmodic contraction of the sphincter muscle of the bladder. Now, the contagion can not be forced backward, because the injected fluid coagulates the discharge, and in that way destroys its infecting properties. The second objection is refuted by a thousand-fold experience, which proves that the majority of strictures of the urethra are due to those morbid changes in the mucous membrane, resulting from persistent and violent gonorrhœal inflammation alone. We have found strictures in patients who for years had suffered from gonorrhœa, and submitted to no treatment at all. The groundlessness of the statement that injections may have such an injurious effect upon the disease of the urethra as to cause the destruction of the epithelial cells of the mucous membrane, coagulate the protecting mucus, and corrode the superficial layers of the new, imperfectly solidified connective tissue, is proved by results obtained in the treatment of gonorrhœal disease of the eye, vagina, vulva, and rectum. If we do not advocate the abortive method by the aid of caustic agents, and concentrated astringent remedies (nay, more, we even urge that the greatest caution be exercised in the local treatment with astringent preparations), it is not because of the bad effects we fear the injections will have upon the mucous membrane, but on account of totally different circumstances. If a large quantity of even the mildest fluid is injected into the urethral canal, contracted through inflammation, the mucous membrane of that canal will be severely stretched or even torn. Furthermore, the sensitiveness of the male urethral mucous membrane, as compared with other mucous membranes, should not be lost

sight of. The mucous membrane of even a healthy urethra is markedly irritated by the mere injection of pure cold water. Hence an inflamed urethral canal requires to be handled with the utmost gentleness.

The injections are best made with an air-tight but easy-acting syringe, made either of hard rubber or tin. Glass syringes are too fragile and seldom of uniform caliber. It should terminate in a short, blunt, and smooth end. As air forced into the urethra is apt to produce spasm of the bladder, every particle of air should therefore be expelled from the syringe. This is best accomplished by turning the nozzle upward and pushing the piston home till the liquid flows out. The amount of fluid that may be injected into the urethra should be in proportion to the length and lumen of that canal. The injection may be made with the patient in any position, but it is best done when he is standing. The physician grasps the exposed glans penis between the thumb, index, and middle finger of the left hand; applies closely to the meatus the end of the syringe, held between the index and middle fingers of his right hand, while with the thumb, inserted in the ring of the piston, he slowly presses it home. In patients affected with hypospadias, and who sometimes have several openings situated behind each other—of which only the last is likely to lead into the meatus, while the rest terminate blindly—the penis has to be twisted upon its axis, so that the meatus, which is situated upon its under surface, is made to appear upon its upper surface, and the syringe is placed upon it almost perpendicularly. The first syringeful may be allowed to come away directly after being injected for the purpose of washing away the discharge that has accumulated in the canal, and then a second injection should be made and retained for a few moments by compressing the lips of the meatus as the syringe is being withdrawn. If the fluid is retained too long, the meatus urinarius is pulled and distended too much, and may become greatly irritated. The more slowly the fluid is forced into the urethra the more deeply will it penetrate. Injections repeated too often are injurious; not often enough, are of little use. We recommend from four to six injections daily. For the purpose of ascertaining the progress of the urethral affection, and to modify its treatment

accordingly, the injected fluid should be allowed to flow into a glass vessel from time to time, and the amount of mucus, epithelial cells, pus, blood-corpuscles, fibrinous masses, and structural détritus it contains, will afford the physician all indications necessary for that purpose. If the dysuria is aggravated by the injections, they must be suspended until the spasm and pain in urinating are entirely gone. Intense chordee and severe urethral hæmorrhage likewise contraindicate the continuation of injections. In regard to the fluid that should be injected, we have been in the habit of using for many years a weak solution of permanganate of potash. We begin with 0·02 of permanganate to 200 grammes [gr. $\frac{1}{3}$ to ʒ vjss.] of water, and gradually increase the strength of the solution, if the sensitiveness of the urethra permits, to 0·04 [grs. $\frac{2}{3}$], in the same quantity of water. Owing to the readiness with which it is decomposed, a sufficient quantity of the medicine, to last two or three days only, should be prescribed. In a great many cases we succeeded with this remedy in subjugating a purulent catarrh in a very few days. If the discharge has already become mucous, we have recourse to the usual astringent remedies, such as alum and sulphate of zinc. Of alum, 5·00 to 250·00 [ʒ iv to ʒ viij] of water is tolerated; of sulphate of zinc or of cadmium, from 0·30 to 0·50 in 200 grammes [grs. 5 to 8 in ʒ vjss.] of water may be used. We generally employ the following formula:

℞ Alumin. crudi, 5·00 [ʒ iv];
Sulph. zinci, 0·50 [grs. viij];
Aqua destil., 250·00 [ʒ viij].
M. To be injected four to five times daily.

If the mucous membrane is very sensitive the acetates are preferable. They may be used in stronger doses. We generally order—

℞ Acet. zinci, 0·50 [grs. viij];
Aqua destil., 150·00 [ʒ v].

Or acetate of alum, in the following manner:

℞ Alumin. crudi, 1·50 [grs. xxiij];
Acid. acetic concent., 1·00 [grs. xvj];
Aqua destil., 200·00 [ʒ vjss.].

℞ Alumin. crudi;
Acet. plumbi basic., āā 1·00 [grs. xvj];
Aqua destil., 200·00 [℥ vjss.].

If the morbid sensitiveness of the urethra has entirely disappeared and a weakened condition of the mucous membrane of this organ is supposed to exist, alum in combination with tannic acid should be tried. We order the following combination:

℞ Alum crudi, 1·00 [grs. xvj];
Tannin puri, 0·50 [grs. viij];
Aqua destil., 200·00 [℥ vjss.].

If the muco-purulent discharge does not perceptibly diminish after using these injections, it may be advisable to resort in addition to the indirect treatment and to employ both methods.

If circumscribed infiltrations are present in the corpora cavernosa, we order cold water to be applied, and cause the infiltrated places to be rubbed with the following ointment:

℞ Extract. belladonnæ, 1·00 [grs. xvj];
Ung. hydrarg., 10·00 [ʒ ijss.].
M. Ft. ung. S. A lump as big as a pea to be rubbed in upon the infiltrated spot.

As soon as fluctuation is detected, the abscess should be opened, in order to avoid the occurrence of urethral fistulæ.

In the treatment of those diseases of the male urethra that have been collectively called *chronic gonorrhœa*, the physician must first ascertain the morbid alteration of the urethra that keeps up the discharge. These morbid alterations may be a markedly relaxed condition of the mucous membrane and passive dilatation of the follicles, gonorrhœal abscesses and granular erosions, croupous inflammation, beginning or already developed strictures, and the granular and trachomatous conditions described by Grünfeld. Those practicing endoscopy may by that means ascertain the character of the lesion; up to the present date, however, we have not seen any brilliant results follow the treatment carried out by means of the endoscopic tube. Those who do not practice it should examine the urine which the patient is instructed to pass in a glass vessel,

and the injected fluid after it comes out from the urethra. To make the examination still more complete, a bougie or sound, sufficiently large in caliber, should be passed into the urethra; and, taking into consideration all the circumstances present, the physician will be able, *per inductionem et exclusionem*, to diagnose the actual condition of the canal. If he has diagnosed the presence of gonorrhœal ulcerations, he should endeavor to prevent the formation of bridle cicatrices by the daily introduction of sounds for a long while, and after each passage of the sound some astringent should be injected into the urethra. In such cases we order nitrate of silver, with or without camphor, as in the following formulæ:

℞ Argent nitric., 0·20 to 0·50 [grs. iij to viij];
Aqua destil., 200·00 [℥ vjss.];
Camph. mucil. gum. arab. subact., 0·10 [gr. 1½]. M.

℞ Liq. ferri sesquichlor. soluti, gtt. x;
Aq. destil., 200·00 [℥ vjss.]. M.

If we suspect the existence of granulations in the urethral canal, we use some insoluble salt or oxide, in the hope of causing them to shrink; for instance:

℞ Magist. bismuth, 5·00 to 10·00 [ʒiv to viij];
Aq. destil., 200·00 [℥ vjss.]. M.

℞ Zinci sulphas;
Plumbi acet., āā 1·00 [grs. xvj];
Aqua destil., 200·00 [℥ vjss.]. M.

℞ Zinci sulph., 0·50 [grs. viij];
Zinci oxid., 1·50 [grs. xxiij];
Aqua dest., 200·00 [℥ vjss.].
M. Must be well shaken before using.

If these injections achieve no good result, a bougie, dipped in mucilago seminum cydoniorum, or gum-arabic, and afterward in powdered bismuth, may be passed into the urethra beyond the granulations. As the greater part of the powder is apt to be rubbed off during the introduction of the bougie into the urethra, and but little reaches the diseased part, it is preferable to introduce the remedies in a solid form, mixed with gum-arabic and rolled out into long pencils, like bougies. When oiled, these are inserted into the urethra and pushed by the aid of a bougie into the membranous portion where the

disease is most likely to be located. The remedies recommended above may be prepared for this purpose in the following manner:

℞ Zinci sulph., 0·20 [grs. iij];
Butyri de cacao q. s. ut f. bacilli urethrales tenues longitudine pollicis No. X.

One of these sticks, having been pushed into the deeper part of the urethra, should be retained there by compressing the lips of the meatus; it will soon melt, and exercise its healing properties upon the affected parts. The patient should be told that, the first time he urinates after the introduction of one of these medicated bougies, he is likely to pass a few drops of blood. Good results are often obtained in chronic gonorrhœa by the introduction of steel sounds of the largest size possible into the urethra. In resorting to the use of sounds for the purpose of curing this disease, the physician should exercise the utmost care, because the forcible introduction of hard solid instruments may readily produce false passages and the patient be seriously injured. Generally it is quite difficult to pass the instrument through the prostatic portion of the urethra. To pass this part with the greatest ease it is necessary to depress the handle of the instrument till it lies between the patient's thighs. The first few times the instrument is introduced it generally causes severe pains, and the operation should therefore be carried out with the utmost gentleness, and with the patient in a horizontal position. After all, a cure will only be achieved by the use of the sounds and injections of astringent medicine when there is no urethral spasm present. To subjugate this condition, the patient should apply warm fomentations to the bladder and penis, and medicated bougies containing morphia or extract of belladonna 0·01 (gr. $\frac{1}{6}$) should be pushed into the urethra. After the spasm has completely subsided, the use of the sound and injections may be again resumed.

[Of all the injections that have been recommended—and I have given them all a thorough trial, both in my clinic and private practice—I found none so efficacious as sulphate of zinc and belladonna, and now use it almost exclusively:

℞ Zinci sulph.;
Ext. belladonna, āā 0·60 = grs. x;
Glycerine, 60·00 = ℥ ij;
Aqua, 200·00 = ℥ vjss.
M. S. For injection.

Recently Dr. Bryant has proposed the irrigation of the urethral canal with a solution of corrosive sublimate, 1 to 40,000 parts of water. More than three years ago I endeavored to cure a number of cases of gonorrhœa by allowing various solutions to flow into the urethra from a fountain-syringe through a catheter, but I found the method troublesome, without deriving an equal amount of benefit from it.

In protracted cases in which the deeper parts of the urethra are involved, and the acute inflammatory symptoms have entirely subsided, I cause deep urethral injections to be made with a long-nozzle syringe, or use Mitchell's medicated bougies. The latter, however, are not always tolerated, for they act as foreign bodies, and the pain they occasion does not subside till the melted ingredients of which they are composed have been ejected. In these cases I have very often succeeded in effecting a cure by making applications of a two-per-cent solution of nitrate of silver through an endoscopic tube with a fine brush. Having first ascertained the exact location of the affected part by means of conical probes, the tube is inserted, pushed in so far that its internal end touches the diseased part, and then the solution is applied.]

The use of cool sitz-baths is of material service when combined with the local treatment. In some cases it is useful to combine the local with the internal treatment by means of the ethereal-balsamic remedies, especially in those cases in which the local measures already recommended have been faithfully tried without accomplishing any good results, particularly if no contraindications, such as digestive disturbances, are present. Lastly, attention should be paid to the possible presence of hæmorrhoids, hyperæmia of the rectum, irritation of this organ by ascaridis, anæmia, scrofula, etc. These require appropriate treatment before a successful result can be attained in obstinate cases of chronic gonorrhœa.

The Indirect or Internal Treatment of Gonorrhœa of the Male Urethra.

The indirect or internal treatment consists in the employment of certain remedies, which when introduced into the system are in greater part excreted by the kidneys, then pass with the urine through the urinary apparatus, and exercise in this manner a curative effect upon the diseased mucous membrane. This also explains the reason why these remedies are only effective in gonorrhœa of the male and female urethra, and not in gonorrhœa of the vagina and uterine canal, and have little or no curative properties in gonorrhœa of the eyes and rectum. These remedies may be introduced into the system either through the digestive or the respiratory organs—possibly also by a prolonged application upon the integument. Among these are the following remedies: Copaiba, balsam of Peru and Tolu, turpentine, cubebs, ol. santal. flava, the so-called wood-oil, or gurgon balsam, and, lastly, certain preparations of matico.

Up to the present time balsam of copaiba has remained the favorite remedy. Its unpleasant taste, however, is a great hindrance to its administration, and many ways have been devised of disguising it. The best is by inclosing it in gelatine capsules; each capsule usually contains from six to seven drops of copaiba (capsules de Mothes et de Raquin). Others give balsam of copaiba in aromatic tincture, or in the form of pills (copaihine Mège of the French). If it is desired to administer it in its purity, it should be ordered to be taken three or four times daily, fifteen to twenty drops each time, on a lump of sugar, or in some liquor prepared as follows:

℞ Tinct. aromat. acid., 5·00 [℈iv];
Balsam copaiba, 20·00 [℥ss., ℈iv].
M. S. Fifteen to twenty drops to be taken four times daily.

For the purpose of administering it in pills, it is best combined with magnesia. Thus we order:

℞ Bals. copaiba, 10·00 [ʒij, ℈ij];
Mag. ust. q. s. ut form. pil. pond., 0·30 [grs. v].
S. Six to eight pills to be taken four times daily.

Or, the balsam of copaiba, made in pills and wrapped in wax, as in the following formula:

℞ Ceræ albæ, 5·00 [ʒ iv];
Adde: Bals. copaiba, 10·00 [ʒ viij];
Pulv. magnes. q. s. ut ft. massa pilul. forment pilul. pond., 0·30 [grs. v], consp. pulv. eodem.
S. Eight pills to be taken three times daily.

[The following are excellent formulæ for administering copaiba in emulsions or pills. These combinations are better tolerated and less objectionable on account of their disagreeable taste, and very efficacious:

℞ Copaiba, 30·00 = ℥ j;
Liq. potassæ, 4·00 = ʒ j;
Ext. glycyrrhizæ, 15·00 = ℥ ss.;
Spt. ætheris nitrici, 30·00 = ℥ j;
Olei gaultheriæ, gtt. xvj.
Mix the copaiba and the liquor potassæ and the ext. of liquorice and spirits of nitre first separately, and then add the other ingredients. (*Bumstead.*)
S. A tablespoonful after each meal.

℞ Copaibæ, 60·00 = ℥ ij;
Magnes. carb., 2·00 = ʒ ss.;
Ol. menthæ pip., gtt. xx;
Pulv. cubebæ;
Bismuth subnitratis, āā 60·00 = ℥ ij.
M. To be divided in pills of 0·3 grs. v each, and coated with sugar.

In this prescription the cubebs serves as a stomachic; the alkali and the bismuth are also good anti-dyspeptic remedies.]

Balsam of Tolu is met with in commerce as an inspissated, resinous substance, which, before using, must be dissolved in spirits of wine. It has no unpleasant taste, but as a remedy is inferior to the other resinoids used in the cure of this disease.

The black Peruvian balsam is administered in the same manner, and in similar doses, but is seldom used, on account of possessing little medicinal virtue.

The therapeutic properties of oil of turpentine are almost as great as those of balsam of copaiba, but this oil is even more unpleasant than any of the remedies already spoken of.

It is best administered in pill form, generally combined with an astringent or iron:

℞ Zinci sulphas puri;
Terebinth. laricis, āā 1 00 [grs. xvj];
Pulv. rad. ratanhiæ q. s.
M. Ut ft. pil. No. 30, consp. pulv. cinnamomi.
S. One pill three times daily.

℞ Ferri sulph., 5·00 [ʒiv];
Terebinth. laricis, 2·00 [grs. xxxj];
Pulv. lycopod. q. s. u. f. pil. pond., 0·20 [grs. iij], consp. pulv. cinnamomi.
S. Five pills to be taken three or four times a day.

Cubebs, piper caudatum, may be administered either in powder or pill form; for the latter, the ethereal extract or freshly powdered berry is well adapted. The following formulæ may be used:

℞ Pulv. piper cubebiæ recent., 20·00 [℥ss., ʒiv];
Sacchar. lactis, 5·00 [ʒiv].
M. S. Divide in doses equale No. 12. To be put in capsules, and taken in forty-eight hours.

℞ Pulv. piper cubebiæ recent., 20·00 [℥ss., ʒiv];
Ext. juniper;
Syr. simplex, āā, 50·00 [℥jss., ʒiv].
M. S. To be taken in twenty-four hours.

If a cure is to be achieved by means of cubebs, the patient will have to take from 13·00 to 15·00 grammes [ʒ iijss. to ʒ iv] of the remedy in twenty-four hours.

Grimault, of Paris, has introduced the use of the so-called matico capsules. They contain an ethereal oil, prepared from the leaves of the drug matico, piper angustifolium or elongatum, extract of cubebs, and balsam of copaiba. We never succeeded in effecting a cure by the administration of matico-oil alone, but we did with matico capsules. The latter are preferable to the copaiba capsules, in so far as they are better tolerated, owing probably to the oil of matico, which seems to act as a stomachic. Of these matico capsules, from nine to fifteen should be taken daily. The so-called "injection végétal," made of matico, and known under that name in commerce, contains ethereal oil of matico and sulphate of copper.

Now, experience has shown that many persons suffer from vomiting and diarrhœa as the result of the internal administration of the antiblennorrhœa-balsamic remedies, and in others a prolonged use of these remedies will occasion chronic gastric and intestinal catarrh. But the injurious effects produced upon the digestive organs are not the only evils occasioned by them. In some patients they also give rise to a peculiar eruption of the skin. Attended by gastric and febrile disturbances, groups of pale, wheal-like eruptions develop about the wrists, hip-joints, and especially on the face. They resemble nettle-rash very closely, and, like the latter, cause severe burning and itching, especially when the patients get warm in bed. This affection of the skin is called *urticaria balsamica*, and, owing to its resemblance to roseola syphilitica, was until quite recently regarded by some physicians—Cazenave, for instance—as proof that gonorrhœa was the initial disease of syphilis. That this assertion is incorrect is proved by the fact that the eruption disappears as soon as the use of the remedy is discontinued.

It is also asserted that the ethereal-balsamic remedies exercise an injurious effect upon the kidneys, in consequence of which Bright's disease is said to result. Now, if to the urine of a person who several hours previously had taken cubebs, copaiba, or turpentine-oil, some strong mineral acid is added, an opalescent, gelatinous sediment is precipitated which might be readily mistaken for coagulated albumen, but it is distinguished from the latter by the fact that it again becomes soluble on boiling, or on the addition of alcohol, carbonate of potash, or ammonia. The researches of Berzelius and Johnson have shown that the constituent elements of the balsamic remedies are an ethereal oil and a resinous acid. The experiments of Drs. Weikart and H. Zeissl have proved that the precipitate above alluded to is not due to the ethereal oil. Consequently, we can explain its production by the following theory: The resinous acids are the vehicles containing the curative principles; in the intestines or blood they combine with the potash or the soda and form a soluble resinous soap in the excreted urine—a resinoid potash or soda. If to such urine a stronger acid than the resinous acid is added, for instance, nitric acid, the resinous acid that is insoluble in water is precipitated as a whitish sedi-

ment. Prof. H. Zeissl and Dr. Weikart sought to make therapeutical use of the transformation which the resinous acid undergoes in the urine, by administering resinous acid alone or resinous soap to patients suffering from gonorrhœa. And they actually succeeded by this means in reducing the blennorrhoic discharge to the least possible quantity, and by a prolonged use of the remedy in suppressing it entirely. But no sediment, or at the most a feeble whitish cloudiness, was seen in the urine; to produce even that, large quantities of the drug had to be administered. Hence it seems that the resinous acids, in their natural combination with the ethereal oils, pass out in the urine more quickly than isolated pure or saponified resinous acids. It can not be maintained, however, that the ethereal oils of the balsams mentioned here are excreted from the system without producing any effect, because clinical experience has shown that, when introduced into the system by inhalation, they accomplish some good results in urethritis and pyelitis. Dr. Bremond, Jr., claims to have obtained better effects from turpentine-vapor baths than from inhalations.

Catarrh of the Glans Penis and Prepuce, Balanitis, Balano-Blennorrhœa, Balanopyorrhœa, Balanopostheitis.

The sebaceous glands, glandulæ Tysonii, situated in the fossa glandis and on the inner surface of the prepuce, secrete so large a quantity of sebum in some persons that it undergoes decomposition—especially when allowed to accumulate, and in those whose habits are uncleanly—and irritates the parts. These become inflamed and produce a profuse discharge. This follicular hypersecretion may be produced by friction of the secreting surfaces — for instance, in masturbators (especially when the preputial orifice is constricted)—by gonorrhœal pus, or chancrous discharges, warts, syphilitic initial indurations, syphilitic mucous patches or eruptions on the glans penis and mucous membrane lining the prepuce, and epithelial carcinoma.

Catarrhal disease of the glans and prepuce manifests itself by an itching sensation which gives rise to erections. Gradually the tickling sensation becomes transformed into a painful feeling. The glans and the prepuce become œdematous; the external surface of the latter becomes red and erysipelatous; a

profuse discharge wells up from the preputial orifice which has the odor of boiled carpenter's-glue. When neglected, erosions and even ulcers originate on the inner surface of the prepuce and on the glans penis; the discharge becomes greenish in color and purulent (pyorrhœa). The lymphatic vessels, situated on the dorsum of the penis, the superficial and deep inguinal glands become inflamed; phimosis and paraphimosis may result; indeed, it is even possible, especially when a chancre is present on the inner surface of the prepuce, that the latter, as well as the glans, will, in consequence of constant pressure or constriction, become gangrenous. Condylomata and vegetations are another result of catarrh of the prepuce and glans penis. In extreme cases balanitis, when associated with phimosis, may terminate in limited or extensive synechia between the glans and prepuce, rendering sexual intercourse exceedingly painful in consequence of the traction between the parts.

Phimosis and Paraphimosis.

Under the term "phimosis" we understand an abnormal constriction of the prepuce to such an extent as to make it impossible to expose the glans fully. In some cases the prepuce can only be retracted sufficiently to expose the tip of the glans penis. The cause of phimosis is the disproportion between the size of the prepuce and that of the glans penis. This kind of phimosis is called *temporary*, in contradistinction from the *permanent* or *congenital* phimosis. The latter condition is due to the structure of the prepuce, which, being too long, forms a funnel-like cap over the glans; the preputial orifice is therefore narrower than in persons in whom this funnel-like covering is shorter and more widely expanded. Again, if the frænum extends up to the urethral orifice, it is difficult to retract the prepuce, and if force is used the frænum will be dragged backward and the glans penis downward; the former is often torn and the wound bleeds. Such long and narrow prepuces are usually traversed by large varicose veins, whose compression during the existence of a balanitis will often occasion œdema.

If a phimotic prepuce is forcibly retracted over the glans

penis, there results the condition known as paraphimosis. The preputial opening that is now drawn backward behind the corona glandis constricts it and causes it to swell up. The return flow of blood from the glans is impeded, while the supply is not retarded. In consequence of this, the glans swells still more; a serous exudation takes place in that part of the prepuce anterior to the constricting point, whereby a semilunar swelling forms on the lower border of the corona glandis, which overlaps the constricting point—a condition that has been called the "Spanish collar." Under unfavorable circumstances the constricted parts may even become gangrenous.

Differential Diagnosis and Treatment of Catarrh of the Glans Penis and of the resulting Inflammatory Phimosis and Paraphimosis.

Balanitis with coexisting phimosis may be mistaken for gonorrhœa of the urethra. The diagnosis can only be based upon the course of the disease. The erosions upon the glans penis and internal surface of the prepuce produced by balanitis sometimes are not easy to distinguish from superficial chancroids, initial syphilitic lesions, and their consecutive phenomena. The chancroid ulcers, owing to their great tendency to inoculate, give rise to numerous deep, sharply outlined small sores; thus we often have follicular ulcerations in the fossa glandis, and deep ulcers occasionally on the frænum. In cases complicated with phimosis the existence of chancroids or chancres can only be ascertained by inoculation and the course of the disease. If the discharge exuding from the preputial orifice is mixed with chancrous virus, the inoculations will produce pustules after a longer or shorter period of incubation, according to the nature of the virus, and the pustules exhibit a tendency to run into ulcerations. Under appropriate treatment simple erosions heal in a few days, sometimes even in a few hours. They are distinguished from syphilitic initial lesions by the total absence of induration or parchment-like hardness beneath them, while erosions which have arisen from excoriations of the efflorescences of roseola syphilitica are accompanied by spots on the body, indolent glandular swellings, etc.

In mild forms of balano-blennorrhœa, frequent cleansing

of the glans and prepuce, and keeping these parts from coming in contact with each other by interposing bits of clean muslin, or a thin layer of cotton-wool, will suffice to effect a cure. The profuse secretion may be quickly suppressed by the application of a strong lead-lotion four or five times a day, or an injection of nitrate of silver 0·10 or 0·20 to 50·00 [$1\frac{2}{3}$ to $3\frac{1}{3}$ grs. to ℥ jss. of water]. After the injection, compresses dipped in the solution may be applied between the glans and prepuce. If it is suspected that there are erosions or ulcers on the glans and internal surface of the prepuce, a long stick of nitrate of silver should be inserted under the prepuce, and by a rapid movement the glans and prepuce are to be cauterized. In addition, the injections with the above preparation should be continued. If the febrile phenomena, the pain and swelling, are severe, and gangrenous sloughing is apprehended, the patient will have to go to bed; the penis should be kept elevated, or fixed on the abdomen, and ice applied to it. If the danger from gangrene does not abate, the constricted prepuce should be split, or circumcised. The latter, in our opinion, is the more appropriate treatment.

Splitting of the prepuce may be done in two ways. Either both layers of the skin are divided at once in the median line or the internal layer alone, the mucous membrane, is incised. The first method, which we resort to in congenital as well as in acquired inflammatory phimosis of moderate degree (where the prepuce is not very long), consists in retracting the foreskin as much as possible to the corona glandis, and passing a grooved director beneath the prepuce. Upon this one blade of a straight scissors is passed, and both lamellæ are divided at once in the median line of the dorsum of the penis to an extent of about one to one and a half centimetre. The slight hæmorrhage that follows is arrested by a few stitches inserted in the lips of the wound, and lead-water dressings are applied to the parts.

The second method we employ in those cases of aggravated congenital phimosis in which markedly dilated veins anastomose in the foreskin. The prepuce is retracted as much as possible, so that the margin of its inner layer is exposed, and it is then snipped with a delicate pair of scissors to the extent

of two to four millimetres. This incision allows the foreskin to be retracted a little more, and an additional portion of the inner layer can now be exposed. With the points of the scissors the first incision is extended, snipping the mucous membrane only little by little, as the prepuce itself is being retracted gradually over the glans penis till the latter is finally entirely exposed. After this has been accomplished the bleeding is arrested, cold-water dressings are applied to the glans, and the prepuce is restored to its normal position. Fresh pledgets of linen or cotton-wool must be inserted several times daily till the incised wound has completely cicatrized.

Circumcision is indicated in those cases in which, in consequence of the accumulation of ichorous discharges, gangrene of the foreskin, or of the glans, or of both is imminent, or has already commenced. The operation is performed as follows: An assistant holds the penis of the patient (who lies on his back) in his left hand, and with the thumb and forefinger of his right hand draws back the foreskin as far as possible toward the corona. The operator then inserts a grooved director between the prepuce and glans, assures himself by sweeping the glans with the instrument that it did not pass into the urethra, carries it in the median line on the dorsum of the glans with the grooved surface facing upward as far as the fossa, and divides both layers of the skin either with a scissors or a sharp-pointed bistoury up to the fossa glandis. The flaps of the skin resulting from the incision are amputated by the aid of a curved pair of scissors, with its concave surface directed toward the glans, following the course of the corona to the frænum, taking care not to injure the corpora cavernosa or divide the arterial branches coursing in the frænum. It is necessary to preserve the frænum, because as a result of its division the integument of the penis loses its point of fixation, and the margins of the wound are liable to become displaced. Bleeding vessels should be tied or twisted; the slight bleeding, however, is generally arrested by sewing up the wound. The operation may also be performed with the aid of Esmarch's bandage. Adhesions between the glans and prepuce should be divided with the scissors. [This operation may be rendered perfectly painless by the use of cocaine, either by injecting a four-per-cent solution

of the muriate of cocaine subcutaneously or simply brushing the skin and mucous membrane of the prepuce a number of times with it. In about five or ten minutes the skin will be found to have lost all sensibility, when it may be amputated and the stitches inserted without causing the patient any pain.]

Paraphimosis calls for the reduction of the constricted glans as soon as possible. This operation may be carried out in the following manner: The physician places both his thumbs upon the glans of the patient, thereby compressing it laterally and at the same time pressing it backward, while with his index-fingers above and the middle fingers below the penis he endeavors to push the preputial welt forward over the corona glandis. If it be no longer possible to replace the foreskin, the constricting welt should be divided with a sharp-pointed bistoury upon a grooved director inserted beneath the ring in the median line of the dorsum of the penis, after which the prepuce may be brought down to its normal position. If the paraphimosis, however, has already existed for several days, it will be impossible to reduce the displaced prepuce; it will then be necessary to divide the collar-like welt with two circular and parallel incisions, and, sparing the corpora cavernosa, the strip of constricting band may be dissected out from the welt alluded to. The edges of the wound should be united with sutures.

Affections of the Lymphatic Vessels and Glands in consequence of Gonorrhœa.

Acute and chronic urethral gonorrhœa occasionally give rise to inflammatory swelling of the lymphatic vessels of the dorsum of the penis and of the lymphatic glands of the groin. The inflammation of the lymphatic vessels manifests itself by one or two smooth or nodular cords, as thick as the quill of a raven, running from the fossa glandis to the mons veneris, and by a linear œdematous, erythematous swelling of the skin. Pressure on the affected tracts, or pinching up a fold in the skin, causes marked pain. Owing to the swelling of these lymphatic vessels, the pain during erections is also aggravated, and for that reason the organ is frequently curved toward the pubis. Under appropriate treatment inflammation of the

lymphatic vessels as a result of gonorrhœa disappears in the course of twelve or fourteen days.

The lymphatic glands of the inguinal region are less frequently affected in consequence of gonorrhœa than the lymphatic vessels. In the majority of cases resolution takes place in these inflamed inguinal glands; but, in debilitated persons, or those afflicted with the tuberculous or scrofulous cachexia, the glands will undergo suppuration. The treatment of inflammation of the lymphatic vessels and glands, in most cases, is limited to the application of cooling lotions, since suppuration seldom ensues. In intense inflammation of the lymphatic vessels, inunctions of ung. hydrarg., in quantities of about the size of a pea twice daily in the course of the affected vessel, are of great benefit.

Inflammation of the Vasa Deferentia and the Epididymis.

The most frequent sequela produced by urethral gonorrhœa in the male is inflammation of one of the vasa deferentia and epididymis. Like pharyngeal catarrh of the mucous membrane traveling downward and attacking the larynx, trachea, and bronchi, so the catarrhal affection of the prostatic portion of the urethra not infrequently extends to the vasa deferentia and epididymis. The affection of these organs, consequently, is not to be looked upon as a metastasis, i. e., as a leap of the catarrhal affection from the urethral tract to the testis, but it originates through contiguity—in other words, the catarrhal process travels on from cell to cell, and as soon as it has reached the vicinity of the caput gallinaginis—which usually occurs in the third week of a gonorrhœal disease—there is a possibility of the affection of a vas deferens with its corresponding epididymis. It is a wonder that the parts mentioned do not become affected in all cases of catarrhal inflammation of the prostatic urethra, and, furthermore, that even in the most pronounced cases of inflammation of the epididymis the simultaneous implication of the vas deferens is not always apparent. This last condition, after all, has its analogy in the pathogeny of buboes that undergo resolution, and which originate, in the majority of cases, without any apparent inflammation of the lymphatic vessels. As a rule, how-

ever, in epididymitis in consequence of gonorrhœa, there is found an inflammatory thickening of the corresponding vas deferens or spermatic cord, and seldom is a vas deferens affected without the coincident disease of the epididymis.

In inflammatory affections of the *vas deferens* the patients complain of severe pains in the vicinity of the abdominal ring, through which the affected spermatic cord passes into the inguinal canal. The pain spoken of becomes aggravated on touching the cord, the latter being readily felt as a dense, hard, round string, like a goose-quill. The loose connective tissue of the tunica vaginalis communis and the adjacent subcutaneous connective tissue of the scrotum become infiltrated with serum, and swollen. General disturbances of the system soon supervene. As in epididymitis, the patients complain of chilliness and a feeling of heaviness in the head; the pulse becomes quickened, the temperature of the skin elevated. Not infrequently nausea, and even vomiting come on; usually an obstinate constipation is present (circumscribed peritonitis). In rare cases suppuration of the thickened spermatic cord may follow.

The subjective symptoms of *epididymitis* usually come on suddenly. The patients claim to have felt at the beginning of the disease a sensation as if a drop of hot liquid had dropped into the affected scrotum. Soon after the affected testis appears to them to have become markedly heavier and walking is irksome. During the first three days the diseased epididymis is felt as a doughy mass at the inferior part of the posterior scrotal wall. On the third or fourth day the swelling of the epididymis becomes more tense, and the organ usually descends still lower. In this manner a twisting of the axis of the testicle upon its transverse diameter takes place. We have likewise had the opportunity of confirming Dr. Bergh's observation, namely, that in some cases a twisting of the axis of the testicle upon its longitudinal diameter takes place, the epididymis appearing at the anterior instead of at the posterior border of the testis. In the progress of the disease the testis itself swells up, sometimes attaining the size of a fist; the increase in size, however, is not due to swelling of the parenchyma of the testicle, but to serous effusion into the tunica vaginalis

propria (acute hydrocele). Finally, there also occurs a serous infiltration into the loose cellular tissue of the scrotal integument; its wrinkles become effaced, and it acquires a bright-red color (erythma glabrum). These phenomena indicate that the epididymitis has attained its height, in which condition it usually remains for five or six days. On the tenth day of the disease, resolution begins, ushered in by febrile exacerbation, and the effusion into the subscrotal connective tissue and into the tunica vaginalis propria begins to be absorbed. The subjective and objective symptoms gradually disappear, so that the disease generally terminates by the beginning of the third week, leaving no trace behind it, save a painless *hardness of the epididymis* consequent upon hypertrophy of its connective tissue. This hardness generally does not interfere with the functions of the testicle; occasionally it is liable to cause a temporary and even permanent impotence. In many grave cases of inflammation of the epididymis and of the vas deferens the semen undergoes morbid changes to such a degree as to become bloody when pollutions ensue (spermatorrhœa cruenta). In cases of bloody semen, the spermatozoa generally are totally absent. Occasionally, even after the termination of an epididymitis, the semen for some time has a rusty color, due to the admixture of blood. Atrophy of the testicle as a result of epididymitis blennorrhagia we have seldom seen, and then only in those cases in which Frick's compressed bandage was applied too energetically and for too long a time.

In very rare cases a cheesy degeneration and necrotic disorganization take place in the diseased epididymis, or in the surrounding tissues, without any coexisting tuberculosis in the lungs, prostate gland, or kidneys. Cheesy foci form, break through the tunica vaginalis and scrotal integument, and discharge a crumbling, cheesy pus. The borders of the perforations in the scrotal integument then become agglutinated directly with the exposed tunica albuginea, from which extensive exuberations of connective tissue are occasionally protruded, constituting a "fungus benignus." Wendelin saw an epididymitis originate in a patient with chronic urethritis, which became associated with marked swelling of the funiculus and secondary peripheral inflammation, attacking the peritonæum,

going on to suppuration and perforation of the bladder and rectum. The case terminated fatally; no autopsy, however, was made.

Another equally rare result of epididymitis is *neuralgia*, whose site can not be more explicitly described than that it is in the course of the pudendal plexus of nerves. This tortures the patients to such a degree that some of them, as reported by Michaelis, demand the operation of castration. The most frequent evil effects of epididymitis are the accumulation of fluid in the sac of the tunica vaginalis propria, known by the name of "hydrocele chronica."

Inflammation of the spermatic cord and of the epididymis in consequence of urethral gonorrhœa is generally unilateral. One epididymis is as often affected as the other, but not both simultaneously. The disease in one generally comes entirely to an end before the other is attacked, and in such cases the left testis is always the one first affected.

Although epididymitis terminates favorably in most cases, still in some fistulæ form in the scrotum, and still more often a permanent accumulation of serum in the tunica propria ensues. We have, moreover, observed that persons who have suffered from repeated attacks of epididymitis blennorrhagica, if they subsequently acquire syphilis, readily become affected with albuginitis syphilitica.

The following painful lesion of the testis may be mistaken for a beginning epididymitis: There are certain individuals who on becoming sexually excited, and without having an emission of semen, suffer such intense pain in the testicle at the slightest touch, and even without touching it, that the pain will cause them to faint. The absence of swelling in the vas deferens and in the corresponding epididymis, the statement of the preceding excitement, and, lastly, the exceedingly favorable effect which the application of cold compresses produces in a few minutes, will show conclusively the true nature of the complaint.

An epididymitis in cryptorchids may be mistaken for hernia or swelling of the inguinal glands. But the absence of the testicle from the scrotum will guide the physician to a correct diagnosis. The differential diagnosis between blennorrhoic

epididymitis and an epididymis resulting from syphilis will be elucidated in the section on syphilitic disease of the testicle.

Finally, we wish to say a word concerning an exceedingly rare morbid alteration of the testicle, which Von Foerster has described under the name of chronic epididymitis terminating in atheromatous degeneration, and which may readily be mistaken for gonorrhœal epididymitis. In this lesion the testicle enlarges gradually, without any febrile phenomena, and the pain is not severe. Subsequently, the pain disappears entirely, while the enlargement remains stationary, and the only change noticeable in the testicle is that it becomes doughy. If such a testis is examined after death an atheromatous substance containing numerous crystals of cholesterine and liquid drops of oil may be pressed out of it.

Treatment of Inflammation of the Spermatic Cord and Epididymis.

The treatment of inflammation of the spermatic cord and epididymis does not vary very much. The main indication is to alleviate the pain, and to limit the inflammation and its effects as much as possible. We have seen the pain most quickly subjugated by the application of Horand's (Lyons) dressing, which we have modified. The dressing consists of three parts: (1) a sufficiently thick layer of wadding; (2) a square piece of India-rubber cloth; and (3) a muslin suspensory. The latter has a triangular, slightly concave shape, and at its upper margin a hole is cut, through which the penis is passed. Its upper corners are provided with two long bands, or, better still, a belt may be used, with a buckle for the purpose of securing it around the abdomen. At its lower angle two thigh-straps or bands are fastened, which may be tied either to the buckles of the belt or drawn through the bands passing around the abdomen, and tied to them. The lateral borders of the suspensory are incised, and each cut is provided with two short tapes. The apparatus is best applied when the patient is in the recumbent position. The patient draws up the genital organs as high as possible against the symphysis pubis; the entire scrotum is then covered with a layer of wadding; the square piece of India-rubber cloth with a circular hole near its upper border

through which the penis is passed is next placed upon the wadding, with the glossy surface directed toward it, and upon that the triangular piece of muslin. Finally, the belt is buckled, or the belly-band alluded to is tied around the waist; next, the thigh-straps or thigh-tapes are made fast to the belt or belly-band; and, lastly, the tapes at the side-cuts are tied over the dorsum of the penis as tightly as possible. By the aid of this apparatus the scrotum can be raised up nearly to the symphysis, and the pains disappear almost immediately after it is applied, enabling the patient to pursue his calling. The epididymitis is generally cured in about eight or ten days. If not, the apparatus may be retained for a longer period. Should the epididymitis be complicated with an acute hydrocele or inflammation of the spermatic cord, the apparatus alone will not be sufficient to relieve the pain. If the pains are not relieved, or the patient has fever, he will have to go to bed, and the scrotum should be suspended in a towel as high as possible, or elevated by a pillow rolled up and placed between the thighs. Cold or cooling lotions may then be applied to the inflamed testicle. No ice-cold applications should be made, especially in tuberculous persons, in whom hæmoptysis has been known to occur under this treatment. Some authors also claim to have seen gangrene of the scrotum produced by the application of ice. Compresses dipped in cold water or in lead-water are amply sufficient. For the relief of the pain, ung. belladonnæ, composed of extr. belladonna 5·00 (ʒ iv) and ung. litharg. 20·00 (3 v), may be rubbed in upon the scrotum. No mercurial ointment should be applied upon the scrotum, for it is apt to occasion a violent eczematous eruption and intense pain. If the pain is very great, morphia may be injected subcutaneously in the inguinal region. It is of the utmost importance in the treatment of epididymitis that the patient should have daily movement of his bowels. It is scarcely necessary to say that, upon the onset of an epididymitis, injections into the urethra and the internal administration of balsamic remedies must be immediately discontinued.

There is another method recommended by Dr. Fricke, of Hamburg, for the purpose of causing the absorption of the effused fluid into the tunica vaginalis. This consists of strap-

ping the scrotum with strips of adhesive plaster. The strips should be half a metre (19 inches) in length and eight to ten millimetres (about an inch) in width. Before strapping the scrotum it and the pubis should be shaved. The physician now pushes the sound testis up toward its inguinal ring, allowing the patient or an assistant to hold it there. He next grasps the diseased testicle in his left hand, brings the longest diameter of the scrotum in a line with the longest diameter of the affected testis, then encircles the upper part of the scrotum with a strip of adhesive plaster. Each subsequent strip of plaster is made to overlap the preceding one like shingles on a roof. Three or four longitudinal strips are laid upon the scrotum from side to side, and these are secured by a few more circular strips. This dressing should only be applied tight enough to retain its hold upon the parts. In three or four days it is generally so loose as to require to be replaced by another. It is now many years since we abandoned strapping the testicle, because its employment not infrequently produces the symptoms of shock, i. e., reflex paralysis of the vascular nerves, especially the splanchnic, through sudden and violent disturbance of the parts, and even gangrene of the scrotum in some cases followed.

In cases of circumscribed acute hydrocele excellent results were often obtained from punctures with a sharp-pointed bistoury. Abscesses of the epididymis should be treated in accordance with the general rules of surgery. The hypertrophy of the connective tissue in the vicinity of the head of the epididymis obstinately resists all kinds of treatment, both local and general; still, in some cases we have obtained good results from the internal administration of the preparations of iodine.

Chronic Hydrocele. Hernia Aquosa.

When the serous effusion which is poured out in the course of an acute inflammation of the testicle, between the two layers of the tunica vaginalis propria, is not absorbed after the inflammatory phenomena have subsided, or, worse still, more and more effusion continues to form, there results a painless enlargement of the scrotum and distention of the tunica vaginalis propria, which has been called chronic hydrocele, or hernia

aquosa, in contradistinction to acute hydrocele. The tumor may attain the size of a goose-egg, a man's fist, or even a child's head, according to the quantity of the fluid that accumulates in the sac. The testicle is always found located in the lower and posterior part of the distended tunica vaginalis. The fluid contained in the latter is clear and watery, and generally contains a large quantity of salts and albuminoids, probably also the so-called fibrogenous substance (Virchow). As a result of injury, such as blows, squeezing, and the like, hæmorrhage readily occurs into the tunica vaginalis, whereby the serous fluid becomes bloody (hæmatocele). When the hydrocele lasts for a long while, excrescences not infrequently form upon the parietal or visceral layer of the sac. These become converted either into a fatty or cartilaginous substance, soon drop off and fall into the hydrocelic fluid (free or floating bodies of the tunica vaginalis). Sometimes the tunica vaginalis undergoes such a hyperplastic thickening that it becomes transformed into a leathery or cartilaginous callosity. This condition is usually associated with the partial union of the two layers. Such adhesions may give rise to the formation of bilocular or multilocular cavities. We obtain positive proof of the presence of fluid in the tunica vaginalis if, on examining the scrotum with a light, it is found to be transparent, and fluctuation is felt in it. In hæmatocele the scrotum, when examined by the help of a candle-light, is less or not at all transparent. Before tapping a hydrocele, the absence of a hernia must be established beyond all doubt. Permanent pressure by the effused fluid may result in atrophy of the testicle and of the cremaster muscle.

In a few rare cases we have succeeded, by simply tapping the tunica vaginalis, in curing chronic hydrocele. The best results are obtained by injecting iodine into the cavity after the tapping, thereby setting up an adhesive inflammation which results in a union of both layers of the membrane. Or Lugol's solution may be used, the formula of which is as follows:

℞ Iodi. puri, 5·00 [ʒ iv];
Kali. iodata, 10·00 [ʒ viij];
Aqua destil., 100·00 [℥ iij, ʒ ijss.].

Or equal parts of tr. iodine and spirits of wine may be used.

In those cases in which the tunica vaginalis has probably undergone a condition of sclerosis, no injection of iodine should be made, because, owing to the lack of vascular supply to the tissues, not only is a union of the opposing surfaces not to be expected, but sloughing of the testicle may be brought about. In such cases we recommend the radical operation for hydrocele under strictly antiseptic conditions.

[Various other remedies have been used, as injections into the tunica vaginalis, for the cure of hydrocele. Carbolic acid has been employed here with excellent results. The following is the formula for it:

℞ Acid carbol. crystal., 10 parts;
Glycerine, 90 parts. M.

Of this solution four to six grammes (℥j to ℥jss.) are injected after the effusion has been drawn off with a trocar and canula. I have succeeded admirably in exciting sufficient inflammatory action in the opposing surfaces of the sac by introducing through the trocar some crystals of red oxide of mercury on a thin, moistened whalebone rod directly after the hydrocele was tapped. But a certain percentage of failures will result from the use of any preparation, the only reliable method being the radical cure proposed by Volkmann, and modified by Bergmann, of Berlin.]

Inflammation of Cowper's Glands.

In very rare cases the inflammatory process extends from the bulbous and membranous parts to the excretory ducts of Cowper's glands. The disease of the glands can only be assumed to be present with certainty when the connective tissue surrounding them is also involved. In this case there originates, between the scrotum and anus, on the right or left side of the raphé, a more or less circumscribed swelling, which is painful at the slightest touch. Micturition is somewhat difficult. Under appropriate treatment the swelling disappears entirely in ten or twelve days; in very rare cases it terminates in suppuration, opening externally or bursting into the urethra. As soon as fluctuation can be detected the abscess should be opened in order to prevent it from rupturing into the urethra.

Morbid Alterations that are produced in the Prostate by Gonorrhœa of the Urethra.

Contrary to the views that were formerly entertained regarding the structure of the prostate gland, it is now known to consist in greater part of muscular substance (sphincter vesicæ externus) and of a number of tubular glands in addition to glandular structure. The excretory ducts of the prostate, like the follicles of the fossa navicularis of the urethra, are liable to become diseased through the propagation of the gonorrhœal discharge to the deeper parts of the urethra. Here, too, we distinguish a *serous*, *mucous*, and *purulent* catarrh. As a rule, the severity of the catarrhal disease of the prostate corresponds to the intensity of the catarrhal affection of the urethra.

The *serous* and *mucous catarrh of the prostate* is generally the result of an inveterate gonorrhœa which the patient has neglected. It manifests itself by a drop of tenacious, albuminoid matter appearing several times daily, unattended with pain, at the meatus, producing a dirty-grayish spot upon the linen, and rendering the spots stiff as if starched. These spontaneous discharges are most probably due to the occasional contractions of the muscular tissue of the prostate; but the pressure caused by the passage of fæces during the act of defecation doubtless also propels the discharge forward. Owing to the capillary engorgement which takes place in the prostatic portion of the urethra, the patient is troubled with dribbling of urine at the end of each act of micturition. The serous and mucous prostatic catarrh may remain in this condition for many years. Should the patient indulge in excesses in *Baccho et Venere*, dysuria, tenesmus, and ischuria will soon become associated with this harmless complaint. If the catarrh persists for a long time, the excretory ducts of the prostate will become dilated, and in time the discharge becomes inspissated, and concretions form in the crypts of the gland. Gradually the mucous membrane of the neck of the bladder also becomes attacked by catarrh, and, as a result, we then have frequently recurring spasmodic contractions of the neck of the bladder. The persistence of this muscular activity leads to hypertrophic development of the muscular element of the prostate. Chronic

prostatic catarrh, however, is manifested not only by difficulty in urinating, but also by febrile paroxysms, especially when it is complicated with stricture of the urethra.

Purulent prostatic catarrh originates from the propagation of the acute purulent urethral gonorrhœa to the prostate, or also from injuries of the gland (the introduction of catheters, bougies, impaction of calculi). As a result of one or another kind of irritating causes, a serous transudation of the submucous tissue of the prostate and an exaggerated amount of secretion in the glandular part of the organ (serous glandular catarrh) are produced. During the time that these lesions are developing in the prostate the secretion of purulent matter in the urethra dies out, and the only discharge that then appears at the meatus is that from the prostate gland—a sticky and tenacious fluid. Gradually small collections of pus form in the gland, corresponding to the number of the excretory ducts affected. Primary diffuse suppuration of the prostate occurs only in those cases which are traumatic in their origin. So long as the œdematous swelling of the prostate is not very intense, the pus-corpuscles originating in the crypts become mixed with the normal secretion of the gland and form with it a gluey, yellowish-green fluid. In progressive suppuration the cavities of the gland gradually become filled with pus and dilated, next some of the glandular spaces coalesce and the entire prostate is then permeated by large cavities. These small abscesses break on the tenth day after the onset of the prostatitis, and, as a rule, rupture into the urethra. The pus tunnels its way into the rectum only in those cases in which suppurative inflammations have occurred repeatedly, and especially when instigated by traumatic causes. The muscular part of the prostate suffers no pathological alteration; it is only in a constant state of contraction, thereby expelling the secretion, and causes tenesmus of the neck of the bladder and the anus.

Patients suffering from *prostatitis* are troubled on the one hand with difficulty in defecation, and, on the other, from frequent desire to urinate. For the purpose of expelling the urine forcibly, the patients, taking a deep inspiration, endeavor to compress the bladder by the action of the diaphragm and the pressure of the abdominal walls. Through the action of

the levator-ani muscle, however, the prostate is elevated and compressed against the symphysis pubis, thus causing still more compression of the urethra that is already narrowed, and entirely preventing the flow of the urine. Not till the patient, completely exhausted, becomes totally passive, and entirely avoids straining, will the urine flow in drops or in a very thin stream variously shaped, causing a violent burning sensation in the urethra. Like patients suffering from stone, those suffering from prostatic disease seek, by pulling or manipulating the penis, to ease the flow of the urine. The introduction of a catheter or sound is quite difficult, and such instruments only will pass as have a *large curve.* Just at the moment when it is necessary to depress the handle of the sound for the purpose of passing it into the bladder, the beak is often turned to one side or the other, because the urethra, in consequence of the unequal enlargement of the prostate, has deviated from its normal position, and the instrument is twisted to the right or left, according as the right or left lobe is more swollen. When the central part of the prostate is swollen it is entirely impossible to introduce an instrument into the bladder, or this can only be done by force. By a digital examination per rectum, the anterior wall of the gut is found to be bulged out by a painful tumor. This painful condition of prostatitis generally lasts from five to eight days. Prostatitis terminates either in gradual absorption of the swelling or in suppuration. The latter is generally ushered in by *febrile movement, indeed even a chill* may occur. The moment the pus is evacuated the patient feels relieved. We have never seen infiltration of urine and fistulæ following prostatitis. When the abscess bursts into the rectum, fecal masses may find their way into the cavity of the abscess, causing grave complications, such as gangrene and pyæmia. If the abscess opens into the rectum or urethra, the disease will almost always terminate unfavorably.

Serous and mucous catarrh of the prostate may be mistaken for a condition of this organ that has been called *prostatorrhœa.* In consequence of sexual excitement, unaccompanied by ejaculation, the prostate may pour out its secretion; the patient becomes aware of this by finding a drop of sticky albu-

minous fluid upon his linen, and by the moisture of the lips of the meatus. At the same time he suffers from pain in the perineal part of the urethra during micturition.

Strictly speaking, prostatorrhœa is no pathological condition, and of little consequence to the general system. Charlatans, however, make very extensive use of it, designating it as spermatorrhœa for dishonest purposes.

In very rare cases extensive infiltration occurs in one of the ischio-rectal spaces, as a result of urethral gonorrhœa. This hinders the patient from walking, standing, defecating; indeed, even lying on the affected side is irksome, but micturition and the introduction of a catheter are not prevented. On introducing the index-finger into the rectum, the physician discovers on one side, but never at the anterior wall of the rectum, a very sensitive swelling, which subsequently may become absorbed. In most cases, however, it undergoes suppuration, and the pus is evacuated into the rectum, a condition liable to result in rectal fistula. To prevent this perforation of the rectum, an early incision should be made through the skin over the affected ischio-rectal space.

In the vast majority of cases of inflammation and swelling of the prostate, resolution takes place. The more intense the pains are in the perinæum, and the greater the swelling of the gland, the greater is the probability that it will suppurate. In consequence of the suppuration, a large part of the gland is not infrequently destroyed. In scrofulous and tuberculous persons an unfavorable termination of the prostatitis may be anticipated. Opening of the prostatic abscess upon the perinæum seems to occur only in those cases in which the tissues surrounding the gland are affected more than its stroma. The irritative condition of the prostate may, in some cases, extend to one of the *seminal vesicles* or *testicles*, and thereby produce *spermatorrhœa*, or inflammation of these organs. Chronic prostatitis—i. e., serous or mucous prostatic catarrh—is attended by little danger, but in the aged may occasion *prostatic hypertrophy*.

The first duty of the physician is to relieve the difficulty in micturition and the violent pains that radiate toward the perinæum, anus, and penis. This is effected by the application

of warm cataplasms, tepid sitz-baths, and narcotics administered internally and locally. Accordingly, we order twenty drops of tincture of cannabis indica every three hours, on a lump of sugar, or belladonna suppositories, if the rectum tolerates them. If the pain is confined to one spot in the perinæum, and the dysuria is not very severe, cold compresses may be applied, and the following ointment rubbed in upon the perinæum :

℞ Extract. bellad., 1·00 [grs. xvj] ;
Ung. neapol. [ung. hydrarg.], 10·00 [℥ ij, ℈ ij].
M. Ft. ung.

The rectum should be evacuated daily, either by the administration of castor-oil or by means of enemas of olive or castor oil. In order to keep open the canal for the passage of the urine, a Nélaton catheter should be inserted and retained in the urethra until the swelling subsides or the abscess bursts. For the purpose of allaying the thirst, we recommend weak lemonade or sweetened water acidulated with acid. Halleri [aromatic sulphuric acid]. The diet should consist of broths, milk, stewed fruit, ice-cream, and the like. Abscesses and fistulæ are to be treated in accordance with the rules of general surgery. For the hypertrophy of the gland that remains, the physician is unable to devise any remedy. In chronic catarrhal prostatitis, benefit may be derived from the internal administration of tinct. ferri chloridi, and the mineral waters, such as Franzensbad, Giesshübel, Rohitsch, Preblau, Kissingen, Selters, Luhatschowitz, and others. Should an obstinate mucous discharge from the urethra remain after the inflammatory phenomena have disappeared, we advise the patient to take the following pills :

℞ Iodureti ferri, 1·00 [grs. xvj] ;
Spirit. terebinth., 0·50 [grs. viij] ;
Ext. gentiana, q. s. ft. bolus. fermentur tales No. 10.
S. One pill to be taken three times a day.

[In acute prostatitis, as in affections of the organs in this vicinity generally, I have often succeeded in aborting the disease by the application of five or six leeches to the perinæum, or at the margins of the anus, and, when the disease has become

chronic, one or more blisters over the perinæum will almost always have a happy effect.]

Inflammation of the Seminal Vesicles in consequence of Urethral Gonorrhœa.

The colliculus seminalis may be described as the starting-point from which the inflammatory disease of the urethra and of the neck of the bladder attacks the organs that secrete and conduct the semen. It is even more difficult to describe fully the pathological condition of the inflammatory process in the seminal vesicle than that of the prostate. We can only draw certain inferences from appearances found in the cadaver as to the nature of the disease. The experienced physician will be able, on examination with the finger in the rectum, to detect, in pronounced cases, inflammation of the seminal vesicle. The latter is situated on the posterior surface of the bladder, directly behind the prostate, and, when inflamed, will assume the form of an oblong oval, painful and hot swelling, having a doughy feel. The subjective sensations in inflammation of the seminal vesicle differ but little from those in prostatitis. There is but one symptom that belongs exclusively to the disease under consideration, namely, the erections *are well-nigh constant, and so painful as to constitute priapism.* According to the observations of Lallemand, Gosselin, and Pitha, involuntary seminal emissions occur, attended by burning pains, the semen occasionally being red from an admixture of blood (red pollutions), or yellow from pus. In the intervals between the involuntary emissions, discharges from the urethra containing spermatozoa mixed with blood or pus also take place. A continued fever becomes superadded very early to this local phenomenon. In cases of intense inflammation the seminal vesicle may become transformed into a veritable pus-receptacle, which gradually empties itself into the urethra, or ruptures posteriorly into the rectum. As a result of suppuration, the seminal vesicle may *disappear entirely* or *become obliterated.* If the disease assumes a chronic character, the seminal vesicle may undergo *induration, calcification, and ossification.* In tuberculous persons the exudation in and around the vesicle may undergo *caseous degeneration.*

The result of grave disease of both seminal vesicles is sexual impotence. There are no special remedies that can be resorted to in the treatment of inflammation of these organs, and those that have been found efficacious in the treatment of prostatitis will, in general, also answer here.

Functional Disease of the Seminal Vesicle and of the Testicle.—Spermatorrhœa, Seminal Emissions, Pollutio Diurna.

The opinion prevails, not only among laymen but also among medical men, that spermatorrhœa is of very frequent occurrence; but, according to our observation, it is quite the reverse. The disease occurs less frequently in consequence of the extension of gonorrhœa than from sexual excesses, onanism, etc. In most of the cases, the morbid condition which is looked upon as spermatorrhœa is really due to a constant discharge from the prostate (prostatorrhœa).

Through excessive indulgence and unnatural gratification of sexual intercourse the secretory and excretory seminal organs are kept in a constant state of irritation, gradually producing exhaustion, atrophy and paralysis of the muscular apparatus appertaining to them. The beginning of the disease manifests itself by a rapid discharge of semen whenever the least excitement of the genital organs occurs, the erections, however, being short in duration and incomplete. Gradually the ejaculation of semen takes place even without any erotic thoughts or voluptuous sensations. While at first the emissions only occur at night, perhaps several times in one night (pollutiones nocturnæ), later on they take place even in the waking hours, with the penis perfectly relaxed, without any erotic thoughts—sometimes, indeed, attended by unpleasant feelings. The least psychical excitement, the most insignificant disturbance of the genital organs, indeed the ordinary act of micturition and defecation, are sufficient at times to produce an ejaculation of semen. Under these circumstances this fluid gradually loses its consistency, becomes watery, and resembles an albuminous secretion mixed with viscid mucus; the spermatozoa constantly diminish in numbers. Finally, it is not ejaculated, but oozes out from the urethra. This constant loss of seminal fluid produces a remarkable mental and physi-

cal exhaustion of the patient. In some cases, marked psychical disturbances, spinal diseases, and paralysis, may gradually supervene. The urine of these patients is generally turbid and cloudy, and has the odor of freshly-ground bone, due to its being mixed with semen. Notwithstanding the great loss of the seminal fluid, some of the patients are said to be capable of procreation; in most cases, however, prolonged spermatorrhœa produces impotence.

The treatment of spermatorrhœa is not satisfactory. The efforts of the physician are limited to measures that will prevent all mental and psychical influences which directly or indirectly irritate the genital organs, and which will brace up the drooping spirits of the patient. For the purpose of preventing the seminal emissions the patient should keep cool, live upon a nutritious but unstimulating diet, moderately indulge in light wines, take cool baths and frictions, cold douches to the perinæum, and clysters of cold water, methodical use of the cold-water cure, or sea-baths. Hypochondriac patients should be urged to take exercise, try country air, so as to become invigorated in every possible way. We administer internally, against the frequent emissions:

℞ Lupulini puri, 0·50 [grs. viij];
Camphora, 0·10 [gr. jss.];
Sacchar. alba., 2·00 [grs. xxxii].

M. Ft. pil. No. X. S. Two pills to be taken during the day, and one directly before going to bed.

Or we prescribe:

℞ Carb. ferri sacchar., 2·00 [grs. xxxij];
Camphora, 0·20 [grs iij];
Pulv. secale cor.;
Sacchar. alba., āā 5·00 [ʒiv].

M. Div. in dos. æqualis No. XV. S. Three or four powders to be taken daily.

If the erections are incomplete, or premature ejaculation of the semen takes place, iron and quinine will be found beneficial, and may be prescribed in the following manner:

℞ Tr. ferri acet. æther., 2·00 [grs. xxxij];
Tr. cort. chinæ vinos, 50·00 [℥jss., ʒiv].

M. S. One teaspoonful to be taken four times daily in sweetened water.

We also use the following:

℞ Extr. quassiæ, 20·00 [℥ ss., ℈ iv];
Sulph. ferri puri, 2·00 [grs. xxxij];
Pulv. cort. cinnamom., 2·00 [grs. xxxij].
M. Ft. pil. No. CXX. S. Ten pills to be taken daily two or three times.

In those cases in which the erections and ejaculations do not take place at all, yet the semen flows constantly, we use:

℞ Acid. phosph. dil.;
Sulph. quinine, āā 2·00 [grs. xxxij];
Camphora, 0·50 [grs. viij];
Ext. cascarillæ, q. s. ut fiant pil. pond., 0·15 [grs. ijss.].
S. Four or five pills to be taken three times daily.

Bromide of potassium may also be prescribed in these cases. We generally order half of the following mixture, to be taken morning and evening:

℞ Kali bromat., 5·00 [℈ iv];
Aqua destil., 100·00 [℥ iij, ʒ ijss.];
Syr. cort. aurant., 12·00 [ʒ iij]. M.

Locally, we advise the use of the following measures: Wax bougies (*sonde à demeure*) to be introduced and kept in the urethra, injections of tanno-glycerine into the urethra (0·50 [grs. viij] of tannic acid and 200·00 [℥ vj, ʒ v, ℈ j] of glycerine), the injection of a weak solution of oil of camphor (1½ to 2 grammes [grs. xxiij to xxxij] of camphor to 25 grammes [ʒ vj, ℈ ij] of olive-oil) into the deeper parts of the urethra through a soft catheter, faradization of the genital organs, and the introduction of a cool steel sound. Little or no benefit is derived from cauterizing the deeper parts of the urethra with nitrate of silver, as recommended by Lallemand, while the danger attending this procedure is considerable.

Diseases of the Bladder caused by Urethral Gonorrhœa.

The bladder, as a rule, only becomes affected, as a result of gonorrhœa, in those cases in which the disease has already involved the prostatic part of the urethra. At the beginning the disease generally attacks the neck of the bladder only; gradually, however, the fundus is also affected. The disease

of the neck of the bladder has an acute character, while that of the fundus is chronic. Hence we distinguish an acute and a chronic catarrh of the bladder.

Acute catarrh of the bladder manifests itself by evidences of intense hyperæmia and a moderate amount of secretion of mucus, the chronic form by a profuse discharge of catarrhal secretion. So long as the catarrhal disease is limited to the neck of the bladder, the patients complain of frequent desire to urinate and to defecate. If the patient endeavors to relieve himself, he only succeeds, under the most distressing pains, in passing a few drops of concentrated acid or neutral urine. After the last of the urine has been voided, one or more drops of blood as a rule follow. The urine is generally clear; on cooling, however, a sediment forms, which contains desquamated epithelium-cells, mucus, sometimes also blood and pus-corpuscles. The discharge from the urethral mucous membrane is then reduced to a minimum. A digital examination per rectum, in most cases, causes an unbearable pain in the region of the prostate, and the introduction of a catheter is usually impossible, because the neck of the bladder, in consequence of the spasmodic contraction, is impassable. Although febrile phenomena are present in all cases of disease of the neck of the bladder, nevertheless, not all of the patients are compelled to remain in bed; but if the tenesmus increases to a condition of ischuria, violent febrile symptoms, preceded by a severe chill, will ensue. If not relieved promptly, the ischuria may cause rupture of the bladder and uræmia.

When properly managed, the acute phenomena will be relieved in from eight to twelve days. The inflammatory affection of the neck of the bladder, however, not infrequently extends to the excretory ducts of the prostate and vasa deferentia. A permanent hyperæmia of the colliculus seminalis remains, and as a result the patient, at each ejaculation, feels as if a hot needle were thrust through his perinæum. Acute cystitis may relapse from the slightest cause, in which case a permanent hypertrophy of the apex of the trigonum Lieutodii (*la luette vesicale of Amussat*) not infrequently develops, causing difficulties in voiding the urine and ejaculating the semen.

The extension of the inflammatory disease of the urethra to the neck of the bladder is promoted or occasioned by various influences. Chief among these are a liberal indulgence in fresh, unfermented beer, unfermented wine, champagne, and soda-water. In addition, injections unskillfully and violently, or too often made, or of too strong solutions, may lead to the development of acute catarrh of the neck of the bladder. It is very often occasioned by the violent use of sounds and catheters, and by the impaction of calculi. Lastly, an acute vesical catarrh may also be produced by the use of cantharides.

If acute vesical catarrh is not carefully treated, still more, if the injurious influences continue, such as the urethral injections, the introduction of catheters or sounds, or the internal use of balsamic remedies, a *chronic vesical catarrh*, or gonorrhœa of the bladder, will be produced. In old persons, who, as is well known, not infrequently suffer from prostatic hypertrophy, and in spinal paralysis, a chronic vesical catarrh will readily be produced under the pernicious influences that have been mentioned. In chronic catarrh of the bladder, febrile phenomena and pain appear only at times. The latter consists not only of annoying calls to urinate often, but pains also dart toward the meatus. The urine is cloudy and opaque, because it contains a notable quantity of pus and mucous corpuscles, blood-coagula, epithelial cells, and a large amount of salts, phosphates, urates, etc. It emits an ammoniacal odor, and reacts alkaline. The alkaline condition is occasioned by the mucus from the bladder, which acts as a ferment, and as a consequence carbonate of ammonia develops from the urine while still in that viscus, and this salt in its turn causes additional irritation. Under unfavorable conditions the catarrhal secretion in the bladder may attain such a degree that large lumps of mucus, pus, and blood are discharged every time urine is voided. The sediment becomes tenacious and ropy, an alteration produced by the action of the carbonate of ammonia of the urine upon the mucus and pus.

Chronic vesical catarrh gives rise to more important pathological alterations than the acute variety. It results in hypertrophy of the muscular coat of the bladder (*la vessie à colonne*),

with simultaneous thickening of the mucous membrane, and in consequence of these lesions paralysis of the viscus may follow. Gradually the ureters, the pelves, and even the kidneys may become diseased. The mucus, pus, and blood-coagula that remain in the bladder may serve as the starting-point for the formation of calculi. Finally, suppuration and ulceration of the bladder may take place, and hence it is readily understood how chronic catarrh may terminate in death, either directly or by retention of urine, and uræmia.

Disease of the bladder is the most serious complication of urethral gonorrhœa. It has a tendency to relapse and to become permanent. So long as the vesical affection is limited to the mucous membrane of the neck the prognosis is still favorable, but if the disease has extended to the fundus of the bladder the physician should be guarded in his prognosis.

When the neck of the bladder only is affected, the main duty of the physician will be to relieve the vesical spasm and the painful micturition. This is best achieved by the removal of all causes, discontinuance of the injections, and of the internal administration of the balsamic remedies that had been employed in the treatment of the gonorrhœa. For the purpose of allaying the vesical tenesmus, there is nothing better than the local and internal employment of the anti-spasmodic and narcotic remedies. Care should be taken, however, in the use of the latter to prevent constipation. We have used for a long time, with great benefit to the patient, equal parts of infusion of herba Herniariæ and chenopodium ambrosioides, of which two or three cupfuls, sweetened with milk and sugar, should be taken daily. This infusion has the additional advantage of diluting the concentrated urine in the bladder without causing diuresis.

In case this remedy affords no relief to the vesical tenesmus, the following preparations may be used:

℞ Extr. sem. hyosciami;
Extr. cannabis indica, āā 0·50 [grs. viij];
Sacchar. alba, 3·00 [grs. xlviij].
M. Div. in pulv. No. XX.
S. One powder to be taken every three hours.

℞ Camphora;
Ext. cannabis indica, āā 0·50 [grs. viij];
Sacchar. alba, 3·00 [grs. xlvij].
M. Div. in dos. æq. No. X.
S. One powder to be taken every two or three hours.

If these narcotics also fail to give relief, suppositories of belladonna, containing 0·01 [gr. $\frac{1}{6}$] of the extract,* should be resorted to. In patients who do not suffer from constipation, suppositories containing morphia, in quantities similar to that of the belladonna, or hypodermic injection of morphine in the perinæum, may be employed. In the majority of cases warm sitz and ordinary baths, and the application of flannels dipped in hot water, wrung out, and applied over the bladder, afford considerable relief. The diet of the patient should consist only of soup and milk. Sweetened water, to which a few drops of acid Halleri [aromatic sulphuric acid], or diluted milk of almonds, is the best drink for him. Formerly, it was customary to use, in acute catarrh of the bladder, oleaginous mixtures and decoctions of linseed with syrupus Diacodii; in our opinion, however, the decoction contains but a slight amount of linseed-oil, and of this very little is excreted with the urine and finds its way into the bladder.

If retention of urine has occurred, the bladder should be evacuated by the aid of a soft catheter. In cases in which the effusion of blood from the capillaries of the neck of the bladder continues, tr. ferri chlorid., administered internally, will be found beneficial. [Nothing serves the purpose so well here as blistering the perinæum. When all other remedies have failed, one or two blisters applied upon the perinæum not only arrested the bleeding, but gave prompt relief to the vesical tenesmus.]

In chronic vesical catarrh the physician will be called upon to evacuate the urine and the ropy secretion several times daily, and to diminish the secretion of mucus as much as possible. With this object in view, the patient should be allowed to drink water plentifully; also mineral waters containing iron, such as Marienbad, Franzensbad, Giesshübler, Ottoquelle, Ro-

* [I have found this quantity entirely insufficient—half a grain at least being necessary.]

hitscher, Luhatschowitzer, Wildungen, etc. In addition astringents, such as alum, tannic acid, or decoct. foliorum uvæ ursi, should be used, as in the following formulæ, for the purpose of arresting the secretion of mucus by the mucous membrane of the bladder:

℞ Fol. uvæ ursi, 20·00 [℥ ss., ℈ iv];
Coque c. q. s. aq. comm. per ¼ h. sub. finem coct.;
Adde: Flav. cort. aur., 10·00 [℈ viij];
Stet in infuso fervids per ¼ hor. vase clauso.
Colat, 300·00 [℥ ix, ℥ vj].
Adde: Syr. althæ, 30·00 [℥ j].
M. S. Half a teacupful to be taken every three hours.

℞ Glycerini puri, 20·00 [℥ ss., ℈ iv];
Tannini puri, 0·50 [grs. viij];
Aq. destil., 50·00 [℥ jss., ℈ iv];
Syr. ononidis spin., 15·00 [℥ ss].
M. S. To be taken in twenty-four hours.

We are unable to say anything in favor of the use of lime-water or tar-water, or of a solution of corrosive sublimate, in this complaint.

If the muco-purulent secretion of the vesical mucous membrane does not diminish from the use of the mineral waters and astringent remedies, it will be necessary to remove mechanically the secretion and urinary sediment that stagnate in the bladder. For this purpose, we cordially recommend the procedure suggested and published by Drs. Brunner and H. von Zeissl, of filling the bladder with liquids by hydrostatic pressure without the aid of a catheter. If the bladder does not evacuate its contents spontaneously, a catheter having a large eye should be introduced, and the organ should be carefully washed out with some weak antiseptic preparation, such as a solution of carbolic acid or the like. For the purpose of counteracting the alkaline condition of the urine, we give internally potas. chlor., 0·50 [grs. viij], per diem, in solution, with very good result.

Diseases of the Kidney that are produced by Urethral Gonorrhœa.

No morbid conditions that originate in consequence of gonorrhœa of the urethra escape the notice of the physician

so often as those that develop in the kidneys. The genesis of these kidney lesions was but imperfectly known to within a comparatively recent period. Many physicians ascribed the diseases of the kidney that complicated gonorrhœa exclusively to the large doses of the resinous diuretics which the patients took. On the other hand, Chomel and Rayer maintain that neither the resinous remedies nor the diuretica acria exert any unfavorable effect upon the kidneys. Still, we have proof that even small doses cause, occasionally, hæmorrhage and ecchymoses of the neck of the bladder. From this point the hyperæmia may extend along the mucous membrane of the ureters and pelves of the kidneys to the papillæ and the straight renal tubules, and produce within the latter catarrhal proliferation of the cells. Now, it is easy to perceive how a catarrh of the bladder, merely by extension, may occasion disease in the kidney, since irritation of the neck of the bladder not infrequently occurs even in gonorrhœal urethritis treated without any balsamic remedies. Further, because this coexisting catarrhal affection of the straight tubules of the kidneys, occasioned perhaps idiopathically, is accompanied by albuminuria, the resinous remedies were charged with having caused the nephritis. It is all the more easy to make this mistake, because it is possible, even in healthy kidneys, after the use of copaiba, cubebs, etc., in large doses, to produce for several days an opacity of fresh urine by the addition of strong mineral acids, which is remarkably like that caused by the presence of albumen. This opaque sediment, however, is not albumen, but the resinous substance precipitated by the acid. But, even if the opaque sediment proves to be albumen, the lesion can only be regarded as a catarrhal nephritis desquamativa, and not diffuse nephritis. Now, it is a settled fact that the kidneys, in most cases, are not attacked by acute gonorrhœa, even if the latter extends to the prostate and bladder, and that it only produces a catarrh of the straight renal tubules when it has existed for a long time and involved the bladder. We have only been able to demonstrate in the cadaver the presence of suppuration in one or both kidneys in those cases in which bad strictures had already formed as a result of gonorrhœa, followed by hypertrophy or ulcera-

tions of the prostate, with or without purulent catarrh of the bladder. *Inflammation of the pelves of the kidneys*, in consequence of gonorrhœa, occurs more often than is supposed. The diagnosis of this condition is based upon the presence of febrile movement analogous to intermittent fever, of an amount of albumen in the urine correspondingly greater than the pus in it, the microscopical demonstration of pus-corpuscles, and irregular pavement epithelium of the renal pelvis. The urine in pyelitis has an acid reaction, being directly the reverse of the condition that appertains to catarrh of the bladder that has existed for a long time. The patients complain mostly of a dull pain in the region of the kidney, and the organ itself is sensitive on pressure.

In most cases the patient complains—if not at first, at any rate later in the course of the *catarrhal nephritis*—of a dull, sometimes of a violent pain in one or both lumbar regions, which becomes aggravated at the slightest touch, and usually extends downward along the course of the ureters. Not infrequently the disease manifests itself by more or less severe febrile movement. The urine in such cases is markedly diminished at first; later, in most instances, it is increased, and is generally of a pale-yellow color. As a rule, it contains a moderate amount of albumen; but, notwithstanding the presence of albumen, the specific gravity is lower than normal. After standing for some time the urine deposits a sediment, in which the epithelial cells of the ureters and bladder, along with mucus and pus-corpuscles, hyaline casts, cylindrical epithelium, and occasionally fibrine casts are found. The urine reacts slightly acid, but, if the disease persists for a long time, it will become alkaline, owing to the decomposition of the salts of the urine in the bladder. We then find the well-known coffin-lid-like crystals of the triple phosphates; sometimes blood-corpuscles are also present. The condition of the extravasated blood will serve to show whether the blood that is mixed with the urine originates in the bladder or in the kidneys. Blood coming from the ureters generally forms clots, shaped like casts of these tubes. In hæmorrhage from the bladder the blood is not intimately mixed with the urine, and the urine that is voided at first is only slightly red in color, but that voided later

becomes as intensely red as if it were pure blood. In hæmorrhage from the kidney the blood is thoroughly mixed with the urine, and the latter has a uniform color from the beginning to the end of micturition. For the purpose of ascertaining definitely the presence of blood-corpuscles in the urine in slight renal hæmorrhages, the urine should be subjected to the potash test, which consists in boiling some of it in a test-tube, adding a few drops of a solution of caustic potash, and then boiling it again. The solution precipitates the phosphates, carrying the coloring-matter of the blood with them, and the sediment is thereby colored red.

The course of a renal catarrh occasioned by gonorrhœa is usually rapid and favorable. The prognosis depends upon the intensity of the primary disease. If the vesical catarrh is intense and purulent, there is danger that the catarrhal nephritis will become suppurative.

Renal catarrh, due to gonorrhœa of the bladder, generally disappears when the primary disease disappears. Hence the treatment of the vesicle and renal catarrh must go hand in hand. Regarding the therapeutics of the disease of the bladder, we refer the reader to what has already been said above. The patient should avoid everything that is liable to produce marked fluxion to the kidney, especially food and drink seasoned with much salt, and also all kinds of diuretics. Cold water, weak lemonade, and milk of almonds are best suited for drinks, and milk and milk-diet as food. Stimulating the skin by means of hot baths is especially useful. The following may be employed for the purpose of arresting the secretion of the muco-pus:

℞ Tannini puri, 1·00 [grs. xvj];
Camphora, 0·50 [grs. viij];
Sacchar. alba, 5·00 [ʒiv].
M. Div. in dose No. 15.
S. Four powders to be taken daily.

℞ Glycerini puri, 20·00 [℥ss., ʒiv];
Tannini puri, 1·00 [grs. xvj];
Aqua destil., 100·00 [℥ iij, ʒ ijss.].
S. To be taken during the day.

In profuse renal hæmorrhage we administer tr. ferri mur. In very obstinate bleeding and persistent lumbar pain, cold

compresses should be applied to both renal regions. The treatment of the pyelitis consists in the internal administration of tannic acid in the manner described above. [In renal hæmorrhage, and also in pyelitis, I can heartily recommend the use of dry cups over the lumbar region as often as may be deemed necessary. From twenty to forty cups may be applied and repeated. It has rendered me excellent service where other much-vaunted remedies failed.] Dittel obtained very good results from the inhalation of the ethereal balsamic remedies.

Gonorrhœa of the Female.

We distinguish (1) gonorrhœa of the vulva, (2) of the vagina, (3) of the uterus, and (4) of the urethra.

The most frequent form is vaginal gonorrhœa, next is vulvar and uterine, and the rarest is the urethral form. Usually several parts of the genito-urinary mucous membrane are affected at the same time. Vaginal gonorrhœa is very often associated with vulvar or uterine, urethral with vulvar or vaginal, vaginal with urethral and uterine gonorrhœa. The entire genito-urinary tract is very seldom attacked *in toto* by gonorrhœal disease.

The causes of gonorrhœa in the female are infection, excessive sexual intercourse, and mechanical and chemical irritation of the mucous membrane. Constitutional diseases, such as chlorosis, scrofula, syphilis, and similar blood dyscrasiæ, irregularities of menstruation, abortions and difficult confinements, neoplasms, and surgical operations, may also occasion a mucous catarrh or prolong one that has originated in some other manner.

1. Gonorrhœa of the Vulva.

Two kinds of vulvar catarrh may be said to occur: an *idiopathic* variety and one that has been produced by *propagation* from adjacent parts. Idiopathic vulvar catarrh originates mostly in consequence of onanism, but may also be caused by the gonorrhœal discharge of men. Vulvar catarrh originating through propagation results from the action of vaginal or urethral discharge of women affected with gonorrhœa, or it ac-

companies soft chancres and syphilitic affections situated on the vulva.

The pathological lesion consists either of a hyperæmia of the affected mucous membrane or its consequent effect (serous, mucous, or epithelial catarrh), or the follicles are inflamed and become filled with pus (vulvitis purulenta). Vulvar catarrh begins with sensual itching, which changes to a burning sensation. If any part of the mucous membrane is denuded of epithelium, or excoriations and erosions such as usually occur on the labia majora and minora at the fourchette are present, the patients will suffer severe pain during micturition. If the disease becomes aggravated the parts of the vulva, provided with loose connective tissue, become swollen. The nymphæ become enlarged to three and four fold their size, and, as a consequence, project in front of the labia majora and are strangulated by them. In milder forms of the disease—serous, mucous, or epithelial catarrh—the discharge from the vulva is slight, mucoid, and tenacious. In purulent vulvitis it is considerable in quantity, thick like cream, and yellowish-green in color, emits a peculiar, fetid odor, irritates the adjacent mucous membrane, and produces erythema of the skin in the genito-crural and inguinal folds. Warts and condylomata are some of the most frequent effects of vulvar gonorrhœa.

Mild cases get well soon, if the diseased parts are washed several times daily, and the sound parts are protected by compresses of muslin or wadding. If the inflammation of the mucous membrane is intense, compresses, dipped in cold water and frequently changed, should be ordered, and pledgets of lint, dipped in a solution of lead or of zinc, placed between the labia majora.

℞ Ext. Saturni [plumb. acet.], 5·00 [ʒiv];
Aqua destil., 200·00 [℥ vj, ℨ v, ʒj].
M. S. For external use.

℞ Zinci mur., 2·00 [grs. xxxij];
Aqua destil., 200·00 [℥ vj, ℨ v, ʒj].
M. S. For external use.

Excoriations that exhibit no tendency to cicatrize may be touched with the solid nitrate of silver.

2. Gonorrhœa of the Vagina.

We distinguish a *serous*, *mucous*, or *epithelial*, and a *purulent catarrh* (kolpitis), according to the severity of the inflammation.

Every vaginal gonorrhœa begins by an undefined sensation, something between tickling and pain. In the serous and mucous catarrh, the vagina is only slightly sensitive, especially at the beginning of the morbid process. In kolpitis the burning sensation is more marked; the introduction of the finger or of a vaginal speculum gives rise to unbearable pain. Micturition also causes more or less pain in vaginal gonorrhœa. The discharge of a mucous gonorrhœa of the vagina is thin, whitish, like mucus, or yellowish; the discharge of the purulent variety is thick, like cream, and has a yellowish-green color. The discharge of both varieties has an acid reaction, in contradistinction to the discharge from the inflamed mucous membrane of the urethra, and of the cervix uteri, which reacts alkaline. This acid reaction seems to be due to the fact that the virginal vulvo-vaginal mucous membrane furnishes a smegma-like secretion containing a fatty acid, while the follicles of the cervical portion of the uterus furnish a mucous secretion. Examined with the aid of a microscope, the discharge of a vaginal gonorrhœa is found to contain mucous corpuscles, a few pus-corpuscles, cast-off epithelium cells, and now and then a few blood-globules.

In attempting to make a digital examination during the initial stage of the disease, the vaginal orifice is found to be contracted and the temperature of the canal increased. Its mucous membrane is felt to be either soft and smooth, or rough and dry. On examining with a speculum a vagina that is affected with gonorrhœa, the mucous membrane, after the discharge that has accumulated at the mouth of the speculum has been wiped away with some cotton on a whalebone rod, is found to be swollen, dotted with red spots, here and there excoriated, and turgid with blood. Occasionally the anterior part of the vagina especially is studded with minute granulations, which have originated through swelling of the follicles and of the papillæ of the mucous membrane. In pregnant

women these granulations attain an enormous size (vaginitis or elytritis papulosa). As it is not possible to use the speculum in young girls, we succeeded very well, in some cases, in lighting up and examining the vagina by the aid of Grünfeld's urethral endoscope.

Gonorrhœal disease of the vagina generally begins at the lower third of the canal and gradually extends to the fornix, indeed, sometimes to the cervical canal of the uterus. The general condition is but slightly affected by a mucous gonorrhœa. The purulent form, on the contrary, is attended, especially at the beginning, by fever, lassitude, loss of appetite, back-ache, vicarious menstruation, and other functional disturbances, on account of which the patients acquire a chloro-anæmic appearance. The local disturbances consist of erythematous redness of the external surfaces of the genital organs, caused by the discharge from the vagina flowing over them. The duration of a vaginal gonorrhœa depends upon the habits of the patient, certain constitutional conditions, and the manner of treatment. A purulent gonorrhœa, in women who are otherwise healthy, can be cured in about fourteen days, provided menstruation does not interrupt the treatment and the cure, which it is apt to do, experience having shown that it will start the disease anew, after it was entirely checked. If the treatment of an acute vaginal gonorrhœa is abandoned too early, and the woman indulges in sexual intercourse, the inflammation either relapses or the catarrhal hypersecretion becomes permanent (*chronic vaginal gonorrhœa*). However, even a vaginal gonorrhœa which, at its inception, was of the catarrhal mucous form, may, through unfavorable circumstances, especially anæmia and frequent and irregular menstruation, become protracted and difficult to cure (*leucorrhœa*). The discharge from chronic catarrh is almost colorless, more mucous than purulent. As a result of the chronic process, and still more from the astringent liquids used against it, the mucous membrane becomes hypertrophied, loses its velvety appearance, feels rough and dry, like tanned leather (*xerosis vaginæ*), and causes a grating noise when a speculum is introduced.

For the purpose of curing a vaginal gonorrhœa, the woman, above all things, must practice the utmost cleanliness. In

cases of intense swelling of the mucous membrane, cold compresses, cool sitz-baths, or the cold-water vaginal douche, by means of the fountain-syringe, should be employed. After the inflammatory swelling has subsided, and the hypersensitiveness has diminished, mineral astringents, and, if these fail, vegetable astringents and tonic fluids, may be injected into the vagina. These injections may be much stronger than those used in urethral gonorrhœa in men. We prescribe the following:

℞ Alum crudi, 10·00 [ʒ viij];
Aqua destil., 500·00 [℥ xvj].
M. S. For external use.

℞ Cortic. quercus or radic. ratanh., 50·00 [℥ jss., ʒ viij];
Coque cum aqua, 1000·00 [℥ xxxij] usque ad remnant 500·00 [℥ xvj] cola.
M. S. For external use.

℞ Zinci sulph., 5·00 [ʒ iv];
Aqua destil., 500·00 [℥ xvj];
M. S. For external use.

℞ Tr. ratanhiæ or catechu, 50·00 [℥ jss., ʒ viij];
Aqua destil., 500·00 [℥ xvj];
Alum. crudi, 5·00 [ʒ iv].
M. S. For external use.

℞ Tannini puri, 5·00 [ʒ iv];
Glycerini, 50·00 [℥ jss., ʒ viij];
Aqua destil., 500·00 [℥ xvj].
M. S. For external use.

These preparations must be used by the patients at least three times daily. They may be injected into the vagina with a uterine or fountain syringe. By the aid of the speculum the nurse or the physician will be better able to apply the remedies to the diseased places. After the injections the vaginal walls should be wiped as dry as possible with cotton-wool, and, for the purpose of keeping them apart, the vagina should be tamponed with pledgets of charpie, dipped in the astringent lotions. These should be changed every two hours, otherwise the blennorrhoic secretion with which they become saturated will undergo decomposition and irritate the mucous membrane. If the pledgets of lint have strings attached to them it will be quite easy to remove them from the vagina.

If the discharge, notwithstanding the frequent employment of the injections, does not cease—as is usually the case, especially in elytritis papulosa—a speculum should be introduced into the vagina, and, after cleansing it of secretions, the mucous membrane should be cauterized with the solid stick of nitrate of silver, making circular sweeps with it as the speculum is being gradually withdrawn. The vagina should be immediately tamponed with dry absorbent cotton, but this must be removed in a few hours, and the injections again used. It is necessary to repeat these cauterizations of the vagina every two or three days, and, failing to accomplish a cure in this way, pledgets of lint, dipped in a solution of alum or of bismuth, should be inserted and allowed to remain for two or three hours, and then followed by injections. [Quite recently a solution of bichloride of mercury (1 part to 5,000 or 10,000 of water) has been used with excellent results.]

3. Complications of Vulvo-vaginal Gonorrhœa.

(*a*) *Diseases of the Glands of Bartolini and their Ducts.*

We distinguish (1) disease of the gland and of the connective tissue surrounding it, and (2) disease of the duct itself. The first lesion is better known and oftener comes under treatment. Both originate usually from the extension of the vulvar inflammation to the walls of the excretory ducts and the gland itself. The disease, however, may also be produced by masturbation, since abscesses of the gland and of the labiæ have been met with in virgins. Both affections generally occur unilaterally.

Inflammation of the gland is ushered in by febrile movement and constantly increasing pain in the affected labium, which swells up immensely. In the course of six or eight days a periglandular abscess forms, which finally bursts on the surface of the mucous membrane of the labium, or, in rare cases, a gangrenous condition ensues, producing an intensely fetid discharge.

Inflammation of the excretory ducts runs either an acute or chronic course; but even an acute inflammation causes only a moderate degree of pain, is unattended by fever, and does

not give rise to any enlargement of the labium. A tenacious, mucous, sometimes also purulent discharge flows constantly from the excretory ducts, a condition that is liable to become chronic. If the discharge can not escape readily, the duct will become distended, ampulla-like, to its utmost capacity, and then some of the matter will be poured out periodically, or the bulging diverticulum that projects on the inner surface of the affected labium undergoes suppuration and ruptures.

Periglandular abscesses occur more frequently than abscess of the diverticulum or of the excretory ducts. Abscesses of the excretory duct are more superficial than the periglandular ones. They are not so painful, burst and cicatrize sooner than the latter. The walls of the glandular abscess are uneven, shaggy, markedly red, and bleed readily. The walls of the diverticulum are smooth and glistening. Catarrh of the excretory ducts is very obstinate, and often resists all kinds of treatment.

Swelling and abscess of the glands of Bartolini may readily be mistaken for *hernia labialis*. The latter is generally located in the central part of the labium majus, and from that point it turns to the side of the vagina in the direction of the tuber ischii, and, with a finger in that canal, the direction of the tumor is readily followed. The diagnosis may be established beyond a doubt by examining the internal abdominal ring and by percussing the tumor.

The other morbid alterations of the labia which are liable to be mistaken for inflammation and abscess of the glands of Bartolini are *atheromatous* and other *cystic tumors* of the labia.

There is a disease of the labia, that occurs very rarely in Europe, and which consists in an enormous hypertrophy of one or both labia. This is known under the name of *elephantiasis arabum pudendum*. In the early stages of the disease the diagnosis may be established by the presence of a local, persisting, or frequently recurring erysipelas. In consequence of this erysipelas, the so-called lymphatic œdema, as is well known, develops, and after a while causes the elephantiatic hypertrophy of the labia. In the further course of the disease, that form which has been hitherto described as elephantiasis

glabra pudendorum may develop into the variety to which has been applied the term *elephantiasis arabum fusca*, on account of the glandular appearance of the affected parts of the skin, and the deep-brown color of the epidermis.

In regard to the therapeutics of the disease, we wish to make the following observations:

If the gland is affected, the patient, in the beginning of the disease, must keep perfectly quiet, and cold should be applied. When softening takes place, the compresses should be renewed less often, so that they may become warm and act as cataplasms, and the swelling lanced as early as practicable, and, if possible, externally, to prevent the lips of the wound from being infected by the vulvar or vaginal discharge. In catarrhal disease of the excretory ducts, cool sitz-baths and pledgets of muslin dipped in astringent solutions, such as tannic acid, zinc, or copper, laid upon the gland, have been found useful. A diverticulum that is in danger of undergoing suppuration should be slit open and touched with lunar caustic once daily. Non-suppurating diverticula of long standing should likewise be slit open, and a weak solution of nitrate of silver (0·10 [gr. 1⅔] to water 100·00 [℥iij, ℈viij]), should then be injected through the cut by means of an Anell's syringe.

(*b*) *Inflammation and Abscess of the Lymphatic Vessels in the Labia Majora and Minora, and of the Lymphatic Glands of the Inguinal Folds.*

These lesions occur especially in suppuration of one of the glands of Bartolini. They are due to the same pathological condition, and develop in the same manner as inflammation of other lymphatic vessels and sympathetic buboes (see Affections of the Lymphatic Vessels and Glands in consequence of Soft Chancre).

3. Uterine Gonorrhœa and its most Frequent Complication: Erosions and Granulations of the Os Uteri.

Uterine gonorrhœa occurs very rarely as an idiopathic disease. As a rule, it is caused by propagation of the morbid process from the vagina. For that reason the cervical canal alone is found affected in most cases, and the body of the

uterus becomes involved only when the disease has existed for a long time.

Gonorrhœa of the cervical canal manifests itself partly by subjective and partly by objective symptoms. The subjective complaints are: Dull, unpleasant sensations, emanating from the pelvic cavity and radiating toward the lumbar region, frequent desire to micturate, and a general feeling of discomfort. The objective symptoms observed in an examination with a vaginal speculum are as follows: A gelatinous, collodion-like, ropy discharge oozes from the mouth of the uterus. This is excreted from the follicles lying between the plica palmatis of the cervical canal, tenaciously adheres to the secreting surfaces, and reacts alkaline. During pregnancy it appears in cheesy flakes. This discharge corrodes the posterior lip of the cervix, and, in consequence, it often becomes streaked with bloody erosions. Uterine gonorrhœa seldom disappears entirely; generally it merges into a chronic catarrh, because, as has been learned through experience, the mucous membrane of the cervix uteri, of all the genital mucous membranes, has the greatest tendency to become affected with chronic catarrh. In consequence of this chronic catarrh the follicles found there grow and become dilated into polypoid growths, which sometimes protrude through the os uteri, become strangulated and drop off (ovula Nabothi). Should the morbid process involve the cavity of the uterus, irregular menstruation will ensue, it will become dilated, the secretions that have accumulated within become decomposed, and occasion the so-called physometra—i. e., accumulation of air within the uterine cavity. When the catarrh has existed for a long while, the mucous membrane undergoes various morbid changes. It is traversed by varicose vessels, studded with ecchymotic and discolored pigmented spots; the ciliated epithelium is destroyed, the glands at the os excrete fat and hyaline matter instead of normal mucus, and become converted into cysts; many of them when grouped together develop into polypi. The walls of the uterus become thickened; prolapsus and displacement of the organ may take place. If the catarrh has extended to the Fallopian tube, sterility will either be the result, or the fecundated ovum remains in the vicinity of the os internum, and gives rise to placenta

prævia (Schröder). Infection with gonorrhœal virus may occasion even metritis and parametritis. The digestive organs and the nutrition become unfavorably affected on account of these lesions, and functional disturbances of the uterus ensue. The appetite is diminished, vomiting occurs frequently, gastric catarrh ensues, followed by passive dilatation of the stomach. The patients become emaciated and anæmic.

In regard to the question of the infecting property of the uterine discharge, we coincide, from personal experience, with the opinions of Cooper and Ricord, that it will produce gonorrhœa in men, but of a milder form. It will do this especially when it is profuse in quantity and contains many pus-cells, when the woman neglects to keep her genital organs clean, and when intercourse is repeated at short intervals with passionate ardor. This condition may obtain more frequently in illicit intercourse than among sedate married couples, and will also serve to explain those cases in which a woman suffering from uterine disease will communicate gonorrhœa to strangers who succeeded in infringing upon the rights of the husband, while the latter escapes infection.

As a result of uterine catarrh, less frequently of severe, protracted vaginal catarrh, small erosions occur on the cervix and sometimes (especially in coexisting syphilis) in the cervical canal. The coalescence of many of these erosions will form large bleeding spots, which are destitute of epithelium-cells. After the expulsion of the glands of Nabothi the erosions in the cervical canal may become converted into excavated minute ulcers, that heal by the formation of flat, grayish-white cicatrices. Not infrequently *granulations*, which vary in size from a millet-seed to that of a lentil, and which bleed readily, form upon the eroded surfaces. Hennig regards them as vascular papillæ of the mucous membrane that have not yet cicatrized, or as new growths, which have sprung from the granular proliferation of the papillæ. In consequence of these erosions and granulations disturbances in the nerves of the sexual organs of the female, which manifest themselves in hysterical convulsions and the like, seem to be produced.

So long as inflammatory phenomena in and about the uterus exist, sexual intercourse must be strictly interdicted, complete

rest should be enjoined, the diet restricted, and cold applications made over the abdomen and sacrum, free movement of the bowels procured, and whatever vaginal and uterine discharge is present should be carefully removed by injections of tepid warm water. If the inflammatory phenomena have already disappeared, the cervical canal should be cauterized two or three times a week with the solid nitrate of silver, at the same time cooling sitz-baths prescribed, and the uterine douche employed. No injections of nitrate of silver should be made into the uterine cavity, because we have seen violent uterine colic and even inflammation of the uterus and of the ovaries produced by them. Healing of the erosions and granulations can only be achieved by persistent and zealous treatment of the primary catarrhal disease of the vagina or uterus. We have seen excellent results from penciling the eroded surfaces with a solution of nitrate of silver or copper. The imperfect digestion and assimilation, the anæmia and chlorosis, must be improved by the administration of good food, tonics, such as iron, wine, mineral waters, and baths, and a residence in the country.

4. Urethral Gonorrhœa in the Female.

Although the pathological lesions which are produced by urethral gonorrhœa are the same in the female as in the male, still it is not so dangerous nor is it apt to assume such a protracted character in the former as in the latter. This is owing to the fact that the urethra of the female is shorter, fewer adjacent organs are so intimately connected with it, it does not participate in erections as in the male, and, being more exposed, it is more accessible to the application of remedies.

The disease manifests itself in the same manner as in the male, by a tickling sensation at the meatus, which soon changes to a real pain, and is aggravated by urinating. The most significant symptom is the presence of a mucoid or muco-purulent discharge, which can be pressed out of the urethra by running the finger over it in the vagina from behind forward. This discharge should not be mistaken for the mucoid or purulent discharge of the inflamed mucous follicles which occur in the crypts on both sides of the female urethra. This fol-

liculitis can be cured in a few days by the use of astringent remedies.

Among the accidents which may be associated with a female urethral gonorrhœa, dysuria is the most frequent, because, owing to the shortness of the urethra, the neck of the bladder is more often involved than in the male. Hæmorrhage in gonorrhœa of the female urethra occurs very seldom, and is very slight. Inflammation of the inguinal glands is exceedingly rare, but warts and condylomata are remarkably frequent results of the disease under consideration.

The treatment of urethral gonorrhœa in the female is almost identical with that of the male. In women who will not submit to injections, cooling baths and the internal administration of the ethereal balsamic remedies should be ordered. In obstinate chronic urethral gonorrhœa the gradual introduction of the solid stick of argent. nitratis once into the urethra has accomplished a cure in many cases.

Gonorrhœa of the Rectum.

Gonorrhœa of the rectum is a very rare disease. It may be produced in either sex by direct contagion, as in unnatural sexual intercourse (pederasty), or by want of cleanliness, the discharge from gonorrhœa of the genital organs running down to and coming in contact with the mucous membrane of the rectum. Hence this disease is met with more frequently in women than in men, the cause just mentioned exercising its effects with greater facility in the former. The skin of the perinæum and around the anus in such cases is, as a rule, erythematous and excoriated. If folds of mucous membrane, in consequence of hæmorrhoids, protrude from the anus, the parts will become infected with still greater facility by the discharge from the genital organs.

The discharge from the rectum is pre-eminently purulent, has a disagreeable odor, and not infrequently is mixed with blood. It flows continuously, and is especially profuse before defecation and after the expulsion of flatus. It produces excoriations and fissures in the folds of the anus, especially in those cases in which infection has resulted from pederasty. In rectal gonorrhœa the patients suffer from pains only during

defecation. During the intervals they complain only of a constant burning or itching in the anus, and a frequent desire to go to stool. In the most pronounced cases the mucous membrane of the anal aperture is reddened and swollen.

We have never met with a case of chronic rectal gonorrhœa resulting from contagion, and it is probable that the discharge from other diseases occurring in this region, such as hæmorrhoidal tumors, syphilitic moist papules, or chronic eczema, has been mistaken for that of gonorrhœa of the rectum. Warts and condylomata are the most disagreeable effects of rectal gonorrhœa, for especially the latter may attain to such dimensions as to interfere with defecation.

The treatment of gonorrhœa of the rectum consists of rest, general baths, or protracted sitz-baths, and injections of water into the rectum; the movement of the bowels being prevented by a restricted diet, and the administration of opiates (and when that condition has been attained the rectum should be immediately washed out with clysters of water). For the purpose of checking the secretion of pus, a one-per-cent solution of tannic acid or of alum should be injected into the gut. In the intervals between the injections pledgets of lint dipped in the same solution should be inserted into the anal aperture. Excoriations or fissures should be touched with the nitrate of silver stick.

Gonorrhœa of the Mouth and Nasal Cavities.

We have never, either in hospital or private practice, met with a case of gonorrhœa of either of these cavities, though it is asserted in some of the older works that the disease occurs in both sexes, the mucous membrane of the nose and mouth being affected in the same manner as the conjunctiva.

Gonorrhœa of the Eye. (Ophthalmia Gonorrhoica Blennorrhoica.)

By Docent Dr. Hock, of Vienna.

The term ophthalmia blennorrhoica is applied to a disease of the conjunctiva of the eye, in which there occurs a profuse discharge of muco-purulent matter, attended by increased lachrymation, intense swelling, and redness of the mucous

membrane, proliferation of the papillary bodies, and sometimes actual ecchymosis; in addition a serious inflammatory swelling of the eyelids and the adjacent integuments may occur, and, in some cases, affection of the eyeball itself, resulting in keratitis and panophthalmitis.

The disease begins with symptoms of a severe catarrh, which within a few days reaches its height. At this point it presents the following morbid picture: The eyelids, especially the upper one, are swollen to the size of a child's fist, and the integument of the lids and that surrounding them is reddened, tense, hot, and œdematous. The upper lid overlaps the lower, its cilia are agglutinated to one another and to the skin of the lower lid by thick, yellowish matter, some of which has dried and formed crusts. If after the removal of the crusts an attempt is made to raise the upper lid with the fingers, a quantity of yellowish matter gushes out, the lid becomes everted, and the intensely swollen conjunctival mucous membrane bulges out. In the tarsal parts the conjunctival connective tissue is seen to be of a deep-red color and intensely swollen, the papillæ congested to such a degree as to give it a velvety or warty appearance; sometimes the latter may be seen with the naked eye as minute excrescences, between and upon which a grayish-yellow matter has accumulated, which occasionally solidifies and acquires the character of a false membrane. If the lids are separated by the aid of an eye-speculum, the ocular conjunctiva, the caruncle, and the semi-lunar fold are seen to be red, thickened, and uneven, the former swollen and forming around the cornea an œdematous, transparent florid or livid wall like a parapet, under which the cornea is buried, its central part only being visible. Generally the patient also suffers from febrile movement.

Of the causes of gonorrhœal ophthalmia it is only necessary to mention here the direct transportation of gonorrhœal matter to the conjunctiva by the fingers of the patient and of the infection of the sound eye with the discharge from the diseased eye. Some authors, Neisser among others, also claim to have found micrococci in the discharge of eyes affected with blennorrhœa.

Ophthalmia blennorrhoica runs an acute course; it gener-

ally reaches its end in three or four weeks. Although in some cases the disease runs a most violent course, attaining its highest intensity in thirty-six or forty-eight hours, resulting in ulceration and perforation of the cornea, yet in others the symptoms are very mild and slower in their progress, and the disease yields much more readily to appropriate treatment. Hence a complete *restitutio ad integrum* is observed only in the milder class of cases. It is true that even in the severer class a cure will be achieved, but always with more or less marked cicatrization of the cornea, anterior synechia, partial corneal staphyloma, and cataract. Often, however, it results in complete phthisis corneæ, panophthalmitis with consequent atrophy of the eye-bulb. Sometimes proliferation of the papillæ remains after a blennorrhœa, a condition which, in some cases, is observed even during the progress of the disease, though in others not until it has run its course. (Chronic blennorrhœa, trachoma, conjunctivitis granulosa.)

Treatment of Gonorrhœal Ophthalmia.

(1) Immediately after the conjunctiva has been infected with gonorrhœal matter it should be washed thoroughly with some antiseptic preparation, such as a five-per-cent solution of natr. benzoic. or a two-per-cent solution of boracic acid, or, for want of either, with pure water, or with a two-per-cent solution of argent. nitric. for the purpose of checking the action of the infecting matter.

(2) At the beginning of the disease the patient should be put on a strictly antiphlogistic diet, and the eye should be repeatedly washed with the antiseptic solutions just mentioned. In contractions of the pupil, atropine (0·10 [gr. 1½] to water, 30·00 [℥ j]) in solution should be dropped into the eye.

(3) If the blennorrhoic process is very intense, the first care of the physician should be to protect the sound eye from infection with the gonorrhœal matter by bandaging it carefully and keeping the patient in a proper position (in this case he will be compelled to stay in bed).

(4) Zealous cleansing of the eye with cold water or antiseptic lotions, application of ice, local abstraction of blood during exacerbations, laxatives, and cooling drinks and low diet should

be strictly enforced. Should the chemosis of the conjunctiva and the swelling of the eyelids be very great, the external canthus must be divided; the lower lid, which is now released, may then be everted by means of Gaillard's snare, and the hæmorrhage that follows may be allowed to go on for a little while.

The most important part of the treatment of the eye, however, is the use of caustics. It consists of the introduction of a solution of nitrate of silver (two to four per cent) or of the solid stick, composed of nitrate of silver and nitrate of potash (equal parts, or one of the former to two of the latter) fused together. The *entire palpebral conjunctiva* should be penciled with one of these agents once every twenty-four hours, the excess of the caustic, neutralized with a solution of salt and the chloride of silver, which thus forms, washed away with water.

In cases of intense turgescence of the palpebral conjunctiva and in chemosis of the ocular conjunctiva great benefit will be derived from scarifications of the membrane, the tension of the swollen tissues and the stasis of the circulation being thereby relieved. Should the cornea become opaque, or ulcers form on it, atropin in solution must be dropped into the eye several times a day, but not simultaneously with the caustic. In impending perforation of the cornea, or when the perforation has already taken place with its consequent effects, in prolapsus of the iris, etc., the treatment indicated for these conditions must be resorted to.

The Effects or Sequelæ of Gonorrhœa in general and of Urethral Gonorrhœa in particular.

By the term effects or sequelæ of gonorrhœa we understand morbid lesions which generally remain a long while after the disease that has produced them has disappeared. These morbid lesions are such as are exclusively produced by gonorrhœa in the urethra itself and beyond its sphere. To these belong gonorrhœal gout or rheumatism, and stricture of the urethra and its effects. Again, they constitute those morbid processes which originate partly from any kind of gonorrhœa, but especially in consequence of the irritation of the gonor-

rhœal discharge upon the adjacent integument and mucous membrane. These include condylomata.

Gonorrhœal Rheumatism.

Gonorrhœal rheumatism or gout is one of the rarest complications of gonorrhœa in both sexes. Writers on the subject are not yet agreed. In regard to its nature and connection with the gonorrhœal disease, some maintain that it is *purely an accidental complication.* Others, again, say that every physiological and pathological process in the genital organs of both sexes may light up rheumatism, and therefore call it "genital rheumatism." Were this the case, rheumatic affections would be much more frequent in the female; but, on the contrary, gonorrhœal rheumatism only occurs in the latter, when attacked by gonorrhœa of the urethra—one of the rarest gonorrhœal affections in women. The so-called old-style unicists claimed that gonorrhœal rheumatism is a rheumatic diathetic disease, that has originated in consequence of the absorption of the gonorrhœal virus, which they compare to the rheumatic pains occurring in syphilis. Other writers are of the opinion that the gonorrhœal process gives rise to a chloro-anæmic condition of the entire system that leads to lesions of nutrition, produces peculiar secondary diseases of the serous membranes, the scrotum, joints, synovial sacs, etc. It should not be forgotten that rheumatic diseases not only occur in catarrhal affections of the urethra occasioned by non-virulent agents, but also in those produced by mechanical causes. Hence gonorrhœal rheumatism would not be so exceedingly rare if there were such a condition as a blennorrhoic diathesis; and, in addition, preputial, vulvar, and vaginal gonorrhœa should likewise be capable of causing rheumatoid disease. This, however, is not the case. In sixty-two cases of gonorrhœa, Fournier observed only one case of rheumatism, and even this is too high a number, when it is remembered that many cases of gonorrhœa get well without the aid of a physician. We agree, therefore, with Fournier, that rheumatism originating from urethral gonorrhœa is occasioned less by the blennorrhagia than by the individual pathological condition of the urethra, an *irritation* of it, like the occasional production of

articular inflammations by the introduction of a catheter or sound into the urethra. Hence, only certain persons are attacked by gonorrhœal rheumatism, and are afflicted by it as often as they contract a gonorrhœa.

We have only met with muscular and articular rheumatism; never with rheumatic inflammations of the synovial membranes or of the periosteum, nor with rheumatic affections of the sciatic nerves. The knee-joint was most frequently affected; still, any other joint in the body is likely to suffer. *One joint only, as a rule, is attacked* at a time.

In some cases the rheumatic affection is noticeable at the very beginning of the urethral gonorrhœa. In many cases, however, the rheumatism does not appear until the urethral disease has become torpid. Gonorrhœal rheumatism originates suddenly. The joint was perfectly well a few hours before the attack came on. If the arthritic rheumatism appeared almost simultaneously with a purulent gonorrhœa, the inflammation of the joint will develop very rapidly and cause marked swelling of the soft parts which surround the joint. These kinds of joint-affections keep pace with the gonorrhœa, and, like it, disappear under judicious treatment in about six or eight weeks. But if the joint-disease appears after the gonorrhœa has existed several weeks, the former will then develop less rapidly, and, like the urethral disease, assume a chronic, protracted character that obstinately resists the most appropriate treatment.

Chronic, like acute gonorrhœal articular rheumatism, is ushered in by febrile phenomena; in the acute joint-affection they are, however, much more violent. In the acute disease, the fever as a rule subsides in about six or eight days. If the articular disease does not assume a favorable course, the fever will remain, though at a lower degree. In chronic gonorrhœal rheumatism, the fever, it is true, lasts longer, but it is less severe. It, however, rises just as in the acute articular rheumatism, whenever an exacerbation of the articular affection takes place.

No exudation into the capsule of the joint can be detected in all cases; but in some an actual hydrarthrosis of considerable dimensions with characteristic fluctuation develops.

The integument over the swelling of the affected joint, as a rule, is neither reddened nor thickened; in some cases, however, an erythema glabrum develops upon it. The affected joint is sensitive to such a high degree that the least movement causes the patient the most intense pain.

The serous exudation that has accumulated in the cavity of the joint may, under favorable circumstances, be absorbed. Under the influence of a constitutional disease, however—for instance, scrofula or tuberculosis—the absorption of the exudation is not only delayed, but a permanent articular dropsy, hydrarthrosis, arthrocele blennorrhagica, tumor blennorrhagicus, originates in some, though exceedingly rare, cases. Some very reliable authors mention a still rarer termination of gonorrhœal rheumatism—namely, suppuration in the joints. A total or partial union of the joints, ankylosis, occurs oftener than the two preceding terminations already mentioned. Gonorrhœal rheumatism has a settled character—i. e., it does not travel from one joint to another. We have never seen it attended by pericarditis or endocarditis. The articular disease exercises no influence upon the gonorrhœal discharge, neither diminishing nor increasing it; still, we have noticed that chronic and acute articular rheumatism subside only when the last traces of the gonorrhœa have disappeared.

The prognosis of gonorrhœal rheumatism, in general, is favorable, the joints, as a rule, recovering fully their normal condition. Ankylosis occurs very rarely—usually in the knee-joint alone. Hydrarthrosis most frequently originates in the knee-joint. Suppuration of the joints may cause death by pyæmia. The articular affection does not last the same length of time in all joints; the disease of the shoulder-joint does not last nearly as long as that of the knee- and ankle-joints; disease of the joints of the phalanges disappears more quickly than that of other joints. Chronic gonorrhœal disease of the joints generally lasts many months; in tuberculous and in badly nourished persons, sometimes more than a year.

The articular disease requires absolute rest and antiphlogistic treatment, such as cold applications and leeches to the affected joint. Hypodermic injections of morphia will be required to assuage the intense pains. When the febrile phe-

nomena are very high, the patient should be subjected to a strict diet, cool or acidulous drinks only allowed, and a daily movement of the bowels secured. If hydrarthrosis has formed, cold or warm applications should be made, with or without ammonia, 50·00 [℥ jss., ʒiv] to water 1000·00 [Oij], according to the congestive condition of the articular swelling. When no inflammatory redness is present, iodine, or some of its compounds, like the following, may be used locally:

℞ Iodureti plumbi;
Ext. belladonna, āā 5·00 [ʒiv];
Ung. litharg., 100·00 [℥ iij, ℥ ij, ʒij];
Ung. elemi q. s. ut fiat emplastr. molle.

S. To be spread upon a piece of chamois-leather or muslin, of the thickness of the blade of a knife, and laid upon the affected joint.

In hydrarthrosis of the knee we have occasionally seen good results from the use of a compress-bandage, made of plaster of Paris, starch, or water-glass. In other cases a plaster composed of gum-ammoniac and acetum scillæ is beneficial. In cases of chronic hydrarthrosis, good results are sometimes derived from the sulphur thermal baths. The treatment of suppuration of the joints, of fistulæ, necrosis, etc., belongs to the domain of surgery. The existing gonorrhœa must be treated with appropriate local and internal remedies. Constitutional diseases, of whatever nature, such as scrofula, tuberculosis, syphilis, etc., demand careful and special attention.

Condylomata; Vegetations; Spitze or Moist Warts.

One of the most frequent morbid changes that are met with in consequence of gonorrhœa, in both sexes, is the formation of warts, or cauliflower-like growths, on the genital organs and their vicinity—on places where pus, sebum, or gonorrhœal discharge is allowed to remain for some time, and, owing to its decomposing effects, the integument or mucous membrane becomes so irritated and macerated that the epithelial layer is destroyed. On these places hyaline granules, of the size of a pin's head, form, which gradually assume the shape of a cone or cock's comb, resembling more or less a dendritic vegetating growth. After these vegetations have attained a certain size they grow very rapidly. The less the parts on

which these cauliflower excrescences grow are cleansed, the more quickly and abundantly these vegetating excrescences will sprout, the more profuse and succulent they will be, and the more readily will they bleed. The cleaner and drier the parts on which these warts are situated are kept, the more quickly will those that already exist shrink, and the less likely are new ones to sprout. If one of these excrescences is cut off at its base, two bleeding points may be noticed on the cut surface, one of which corresponds to the entering, the other to the emerging capillary vessel.

Histogenetically regarded, two directly opposite views prevail in reference to this lesion. While some writers look upon the growth as a hypertrophic proliferation of the tegumentary papilla, others hold that the origin of condyloma is mainly due to an exuberant growth of the cells of the rete Malpighii, at the expense of the tegumentary papillæ, whose cells spread their prolongations not only upward but also downward, like a cock's comb, forcing their way in between the papillæ. The epidermal cells have a very slight tendency to undergo a corneous change, and even the uppermost layers retain the succulent condition of the Malpighian cells. The whole is covered by a very thin corneous layer. No nervous filaments have yet been detected in the exuberant growth spoken of.

Warts or condylomata are most frequently met with upon the glans penis, especially in the fossa coronaria, on the corona, on the foreskin, especially its internal or mucous membrane; on the frænulum, on the large and small labia, in the urethra and vagina, on the os uteri, at the lower part of the rectum, on the navel, on the skin of the genital organs generally, and in the neighborhood of these organs. If the condylomata are situated upon the integument or mucous membrane of the corona glandis or prepuce, in a person with phimosis, they will be reddened and softened like raw flesh, owing to the fomentation they are constantly subjected to. If they are situated upon exposed places they will be dry, corneous, yellowish or whitish in color. The vegetations that are situated upon the mucous membrane of the vagina are so brittle that they are often broken off by the introduction of the speculum.

Condylomata assume a different shape according to their

location. If the warty growth is compressed between two opposing surfaces, the so-called cock's-comb-like vegetation will originate. If the condyloma is subjected to pressure from above, the excrescence will gradually be flattened and assume the form of a mushroom. On places where the growth may freely develop, linear pedunculated, strawberry-, mulberry-, or cauliflower-like excrescences will originate. If many such growths are in close juxtaposition, they will mutually compress one another, and acquire smooth surfaces, which are separated by narrow fissures, and form clusters similar to the blossoms of thyme; hence the old writers called them acrothymion, or thymos. These warty efflorescences cause a good deal of mechanical obstruction, and, moreover, owing to the alteration which they undergo in their course, exercise an unfavorable influence upon the general system. Thus, they may occlude the preputial opening and the meatus urinarius, preventing the removal of the smegma from beneath the foreskin, the flow of the urine, and the ejaculation of the semen. In a similar manner the female urethral meatus and the vulvar aperture may become occluded by pointed condylomata, and micturition and coitus may likewise be rendered difficult. By the growth of large condylomata around the anus, in both sexes, defecation may become very difficult and painful. Those condylomata that are situated upon places where they are subjected to continual friction or pressure readily become gangrenous. Ordinary condylomata may be mistaken for epithelial carcinoma, for the cauliflower tumor of Clark on the os uteri, and for the flat specific condylomata. The manner of development, the course, the attendant phenomena, the result of the treatment that has been resorted to, will aid the physician in forming a correct diagnosis. It is very easy to mistake vegetations for the flat syphilitic condylomata, for both kinds may be met with at the same time.

Experience as well as experiment has proved that condylomata are transmissible by direct contact.

Condylomata possess remarkable powers of reproduction: one shoot may be cut off, and five others will grow in its place. The small warts, not bigger than a millet-seed, and sprouting close to each other, are the most difficult to get rid of.

Pedunculated warts may be removed with Cooper's scissors, or tied and allowed to fall off. When the warts are cut off, enough mother-tissue should be taken away with them. The wounds should be moistened with a solution of ferrum chloridum, to check the bleeding and prevent the future growth of the condylomata. The local application of a solution of chloride of iron is especially useful in large aggregated condylomata; the astringent action of the iron contracts them, and prevents bleeding if they are subsequently cut off. Tincture of iodine acts in a similar manner, but far less effectively. The concentrated acids very seldom answered our expectations. Solutions of corrosive sublimate in spirits of wine, or in sulphuric ether, 0·5 [grs. viij] to 50·00 [℥jss., ʒiv], rendered much better service. Plenk's paste acts more intensely than the solution of mercury; it may be prepared in the following manner:

℞ Sublim. corros.;
Alum crudi;
Carbon. plumbi;
Camphoræ;
Spirit. vini;
Aceti vini, āā 5·00 [ʒiv].
M. S. For external use.

The precipitate is applied to the warts with a camel's-hair brush. Plenk's paste, however, is apt to produce unpleasant effects, such as intense œdema and mercurial stomatitis.

The hard, dotted warts are readily removed by the use of arsenious acid or iodide of arsenic mixed with mercurial ointment. For this purpose we prescribe:

℞ Acidi arsenicosi, 0·20 [grs. iij];
Ung. hydrarg., 5·00 [ʒiv];
M. Ft. ung.

℞ Arsenic. iodat., 0·20 [grs. iij];
Ung. hydrarg., 5·00 [ʒiv];
M. Ft. ung.

A lump of salve, of the size of a lentil, is applied to the warts several times a day upon some wadding. Moist, secreting condylomata are sometimes made to shrink by dusting them

with pulverized alum, calomel, oxide of iron, sulphate of iron, and savin-powder. If the prepuce is phimosed, it must be split or amputated, in order to expose the condyloma. Large aggregations of warts on the labia are most appropriately treated by ligation or with the galvano-cautery, or the thermo-cautery of Paquelin. In tying condylomata, not more than one root should be embraced in each ligature, because the tying of many large aggregated clusters of excrescences has, in some instances, produced tetanus and terminated in death. But, whatever method be selected for the removal of condylomata, cleanliness and keeping the parts dry should always be enforced. Cold applications alone, constantly and properly made, have caused the vegetation to fall off in cases that have resisted repeated cauterizations and excisions.

Strictures of the Urethra.

One of the most frequent sequelæ of urethral gonorrhœa in the male is stricture of the urethra. The contraction may take place at any part of the urethra, save in the prostatic portion. An obstruction to the passage of a catheter or sound only forms in the prostatic portion of the urethra when the prostate, from inflammation, hypertrophy, or swelling, has become so large that it compresses the lumen of the urethra from without inward. We may classify strictures in the other parts of the urethra, according to Dittel, as spastic, inflammatory, and organic varieties. By the term *spastic* strictures we understand transient constrictions of the lumen of the urethra, occasioned by spasmodic contractions of the muscular apparatus of that canal. One can easily convince himself of the existence of such a stricture by attempting to introduce a large sound. It will be grasped and held tight at some point, but by patiently waiting, refraining from exercising the least pressure with the instrument, and allowing it to lie quietly for a while in the urethra, it will soon, almost of its own accord, slip into the bladder. Some very good surgeons deny the existence of this form of stricture of the urethra. Many prominent authors, however, such as Esmarch, Dumreicher, Albert, Hunter, and others, maintain with justice that this form of urethral contractions does occur. The spasm mostly affects the muscular

tissue surrounding the membranous portion of the urethra, the transverse perinei profundus muscle; in other instances the spasm attacks the urethra at various points and occasionally may become so intense that it is not possible to withdraw the sound, which is already partially in the urethra, giving one the impression that it is firmly held there.

Transient strictures due to spasmodic contractions of the urethra manifest themselves by the patient being attacked by a sudden desire to urinate, after having emptied the bladder a little while before without any difficulty. The urine, after much pressure, pain, and a burning sensation, comes away in drops, or is expelled spasmodically (dysuria), or it can not be voided at all (ischuria). These strictures may occur even in persons who never suffered from gonorrhœa, after having had their feet wet, or after indulging too much in imperfectly fermented or still fermenting drinks, new beer, etc. These symptoms, however, almost always accompany organic strictures of the urethra. In regard to the treatment of this condition much benefit will be derived from belladonna suppositories, moist warm applications and warm sitz-baths twice daily. In addition, the patient must abstain absolutely from the use of all kinds of drink that are liable to irritate the bladder, such as champagne, cider, new beer, and fresh wine. In regard to the *inflammatory* strictures we will say briefly that they are produced by thickening and swelling of the mucous membrane. These strictures develop in consequence of gonorrhœa, or after operations on the rectum or on the external genital organs in the female.

The *organic* strictures of the urethra may very properly be divided, as proposed by Dittel, into two chief groups. One main group is occasioned by proliferation of the connective tissue, the other by the development of a structure heterologous to the tissues of the urethra. We will only speak here of the first form, that form which occurs so frequently as a result of gonorrhœa. Dittel briefly calls this kind of urethral stricture, when it is in a state of exuberation, callous stricture; when in a state of shrinking, atrophic stricture. The symptoms of organic stricture of the urethra are as follows: The stream of urine becomes thinner and changes its direction.

Simple division of the stream of urine is of no pathognomonic value, and in most instances is occasioned by the agglutination of the meatus with mucus. The bladder is never entirely emptied of its contents, and in consequence thereof the patient is compelled to urinate oftener. That part of the urethra behind the stricture is often dilated like a diverticulum, and, if the stricture lasts for a long while, rupture of the urethra may occur, terminating in infiltration of urine and fistulous openings behind the stricture. In long-standing stricture of the urethra, catarrh of the bladder will develop, and may be followed by pyelitis, nephritis, and death.

In regard to the form of the stricture, it is sufficient to say that it varies very much. It may be a sharply defined projection, or only a ridge stretched directly across the lumen of the urethra; or, again, a resisting, hypertrophic circular band. Sometimes caruncle-like granulations form; and, finally, the contractions, in some cases, are produced by angular deviation of the urethra from its normal course, in consequence of circumscribed lateral atrophy of the connective tissue surrounding the urethra.

Strictures in the membranous portion often occur from the cicatrization of gonorrhœal ulcers that have burrowed and undermined the mucous membrane. In like manner, adhesive inflammations may give rise to strictures in the urethra.

Strictures are most frequently found in the membranous portion or in the anterior part of the pendulous portion. Occasionally two and even three strictures are found behind each other.

For the purpose of diagnosing a stricture, the physician, in the first place, should get a view of the stream of urine, the patient being required to urinate in his presence. A perfectly clear stream of urine, which does not deposit any sediment, excludes a severe stricture. The patient should not be allowed to urinate directly before it is proposed to examine him with instruments. The examination is best conducted with the patient lying on his back, while the physician stands at his left side. Having warmed and oiled the sound (which should be as large as will enter the meatus), and retracted the foreskin, the physician, holding the penis between the thumb, in-

dex, and middle fingers of his left hand, and the instrument between the thumb and index-finger of his right hand, inserts the instrument into the meatus, the little finger of his right hand resting upon the body of the patient for support, thus affording the hand rest and security. In this way he guides the instrument as it passes into the bladder. The penis is drawn up on the sound more than the instrument is pushed into the urethra. If an obstruction is encountered, the next smaller-sized sound should be tried; and if a number eight sound does not pass, it will be better to resort to English gum-elastic or conical bougies. No metallic instruments smaller than number eight should be used, on account of the imperfect sensation which they transmit to the fingers, and the risk of making a false passage with them. Conical elastic instruments *without* bulbs are not worthy of recommendation, because they easily become imprisoned in some of the dilated follicles and cause irritation. If no sound can be passed through the stricture, an attempt should be made to pass an English elastic catheter; and if this too fails, it will be necessary to resort to the use of filiform bougies. In this case it will be well to try the procedure recommended by H. von Zeissl, which consists in filling the urethra with filiform bougies well oiled, and pushed clear down to the stricture, and then a trial should be made carefully with one after another to pass it through the stricture. One of them will then surely go through. Having succeeded in passing the instrument at last through the entire length of the urethra, it will then be necessary to map out the proper course of treatment to be pursued. There are three methods of treatment, namely, slow or gradual dilatation, rapid dilatation, and division of the stricture.

We only practice gradual dilatation and division of the stricture from without inward. We will first speak of the *gradual dilatation.* If the stricture is so small as to permit only a filiform bougie to be passed, a catgut bougie should be inserted, and allowed to remain in the urethra until it has become distended to its utmost capacity. If, during this time (half an hour to an hour), no unpleasant symptoms have been produced, an effort should be made to pass a fine English gum-elastic bougie. If we have finally succeeded in passing this

instrument, no further trials should be made at the time; but the next day another effort may be made, commencing with the size left off on the previous day, and afterward using larger bougies gradually. Having finally succeeded in passing through a thin gum-elastic catheter, it should be left in the bladder, and tied in for twenty-four hours, if no unpleasant effects are produced. In this way dilatation is accomplished much more rapidly; on the next day a larger instrument may be introduced, and so on, till the urethra admits the largest-sized sound. If a catheter is retained in the urethra, the urine should be drawn off every three hours, or as soon as ischuria comes on. Should symptoms of nervous irritation, urethral fever, or other unpleasant signs manifest themselves, it will be necessary to remove the instruments immediately. In regard to the symptoms of irritation produced by the introduction of an instrument into the bladder, we have the following observation to make: Some persons do not tolerate the passing of an instrument into the urethra even if they have no stricture whatever. A little while after the instrument is inserted they are seized with a chill, followed by high fever, violent headache, or at least a sensation of discomfort in the head. These phenomena generally soon disappear entirely; in some cases, however, they often reappear, sometimes lasting several weeks, till the patient either becomes habituated to the passage of the sound, or has been cured of his stricture. This violent irritation, which Dittel calls nervous reaction, may be allayed by small doses of morphine, administered from half an hour to two hours before using the instrument. Should this fail, and the nervous phenomena come on with equal severity after each attempt at dilatation, the gradual dilatation of the stricture will have to be abandoned and external urethrotomy performed. If the urethra has been injured during the introduction of an instrument, a similar state of reaction, which Dittel calls surgical fever, is liable to ensue. The latter in reality differs only from the nervous reaction by the fact that the patients did not suffer from any phenomena of irritation during the previous dilatations. The phenomena of irritation are, however, most violent when the kidneys and bladder are seriously diseased at the same time. This affords us a guide in treatment. If the

introduction of an instrument into the urethra is tolerated, it may be allowed to remain in it a long time. If reaction takes place, or the patient is already advanced in life, we will have to be content with keeping the instrument in the urethra for a short time only, from five minutes to half an hour, and to introduce it only every other day. It is absolutely necessary, before beginning the treatment of a stricture, to make a careful microscopical and chemical examination of the urine. Pyelonephritis, for instance, is liable to become aggravated so rapidly, even if the dilatation is practiced with the utmost care, that death ensues in a very few days. Hence we practice external urethrotomy—the so-called *boutonnière*—in patients who do not tolerate the dilatation of the stricture with instruments. Gradual dilatation, to be successful, requires a year's after-treatment, i. e., the constant introduction of instruments. If this is discontinued, even for a short time, the stricture contracts again, and the treatment must be renewed.

We will describe the two methods of division of a urethral stricture, viz., division of the stricture from without inward and from within outward—urethrotomia externa et interna. The division of the stricture from without inward is now performed in those cases in which the stricture is so tight that even the finest filiform bougie can not be passed, or in those in which febrile or nervous reaction ensues whenever a dilating instrument is introduced. For the details of this operation, we refer the reader to the special works on surgery. We have obtained excellent results from the boutonnière. We have discarded entirely internal urethrotomy and rapid dilatation. Both methods, it is true, relieve the patient from his stricture very quickly, but they expose him to the great danger of infiltration of urine, and, like the harmless gradual dilatation, require a long after-treatment. The dangerous character of this operation, and the fact that strictures after having been divided return in as severe a form as before the operation, if no after-treatment is carried out, and that a certain degree of perviousness of the urethra is always presupposed to exist for the purpose of admitting the necessary instruments, are the reasons why we never perform this operation.

[By injecting a syringeful of olive-oil into the urethra, so

as to distend it fully, the passage of the bougie will often be materially facilitated. Sometimes injections of ice-water have served a very useful purpose by causing contraction of the engorged tissues, and thus rendering the strictured parts permeable to a bougie or catheter. In this connection, I would add that in retention of urine coming on suddenly, in consequence of engorgement of the tissues following a debauch, coitus, or exposure to cold, a hot bath, with a full dose of morphine administered internally, has often accomplished excellent results. When these remedies fail, it will be necessary to anæsthetize the patient for the purpose of introducing a catheter to draw off his urine. If time permits, I often succeed, by blistering the perinæum, in reducing the engorgement of the strictured part of the urethra to such a degree that bougies or catheters pass with comparative ease. Mr. Tevan, of London, resorts to leeching the perinæum for the same purpose.

In regard to internal urethrotomy, in properly selected cases the operation will be of signal benefit, especially when time is an element to be considered. Where the method of dilating a stricture with sounds or bougies requires many months, internal urethrotomy will achieve the same result in as many weeks; though, to be sure, the after-treatment with sounds can not be dispensed with after this operation any more than in any other method.]

SECTION II.

SOFT CHANCRE OR CHANCROID.

The term "chancre" has generally been applied to an ulcer the origin of which has long been ascribed to a contagious specific matter, which was itself reproduced in the ulcer.

Up to the present time we have not succeeded in establishing a clear, scientific, and comprehensive definition of that ulcer which is commonly called (soft) chancre.

We know no more regarding the contagious element which is capable of giving rise to soft chancres than we do of the nature of contagions in general. The conception of the contagion is an abstract one. We only know that, if a minimum quantity of the discharge from such an ulcer comes in contact with living cutis or mucous membrane, it will produce in a short time at that place an ulcer analogous to the parent-ulcer, and from this fact we conclude that the discharge possesses contagious properties.

Uninjured epidermis and epithelium-cells are a protection against the action of the chancre-virus. There is no special congenital predisposition or susceptibility to the action of the chancre-poison, neither is there any particular immunity or freedom from it. All warm-blooded animals are susceptible to the action of the chancrous virus. The effect of the poison of the soft chancre is said to be markedly increased when a difference exists in the superiority of the race between the infected and infecting. Newly-born children and nurslings resist infection by a chancroid less than adults, possibly because their cutis is more richly supplied with blood-vessels. Different tissues are also differently affected by the contagion. Thus, the virus spreads more rapidly in loose, spongy tissues,

rich in blood and lymphatic vessels, than in textures that are poor in vascular supply. The submucous, subcutaneous, and interstitial connective tissues are very susceptible to the invasion of the chancre-poison. On the mucous membrane the chancroid ulcers are generally smaller than on the common integument. The chancrous poison never attacks serous and fibrous tissues, and very rarely those of a cartilaginous nature. Some parts of the skin afford the virus a more favorable soil than others. Larger chancrous ulcers will form more rapidly upon the inner surfaces of the thighs than upon the skin of the intercostal spaces or upper extremities, and upon the skin of the hypochondriæ quicker than upon the lateral surfaces of the thorax. Active local disturbances of the circulation of the skin—hyperæmia, stasis, œdematous swelling, and especially a tendency to purulent infiltration—favor the destructive action of the chancrous poison.

Action of Chancrous Virus and Development of the Soft Chancre.

If chancrous matter in some way gets under the epidermis or epithelial cell-layer, a bright-red spot about the size of a lentil makes its appearance at the point of insertion in from twelve to twenty-four hours. By the next day this spot becomes raised, and forms a kernel surrounded by a red areola. On the third day the kernel is transformed into a pustule, the areola spreads in extent corresponding to the growth of the pustule, and the skin within this areola is hard to the feel. It is sensitive and painful when pressed upon with the finger. On the fifth or sixth day the pustule collapses and dries up, forming a crust, and the red areola becomes smaller. On removing the crust, a circular, deep, or shallow ulcer, with sharp, undermined borders, is brought to view, whose bottom is covered with a layer of grayish matter.

The soft chancre develops on the mucous membrane in a similar manner, but here the pustules burst much earlier. If the chancrous matter penetrates into a sebaceous follicle, an acne or furuncle-like pustule will form, which also becomes transformed in from twelve to twenty-four hours into an ulcer. Excoriations and fissures become transformed by contact with chancrous matter directly into ulcers without the intervention

of the pustular stage. The ulcers, however, are not round, but shaped like the excoriations or fissures, being mostly gaping and irregular.

Multiple chancroids, originally circular, may coalesce and then form one chancroid irregular in shape and form.

The chancrous ulcer enlarges proportionally in depth and circumference, but, when finally it begins to heal, the surface of the sore granulates, and a disposition to cicatrization is manifested. Sometimes the margins of the chancroids do not mark the limit of the action of the chancrous contagion. If a chancrous ulcer is cut through, the wound soon becomes an infected sore, the chancroid spreading and involving the entire incision.

The chancrous ulcer emanates from the inflammatory alteration of the tissues, by which the affected structures become disorganized, passing through the conditions of fatty degeneration, softening or deliquescence (*molecular disintegration*), or the layer of tissue that is attacked by necrosis forms a *diphtheritic* membranous slough, which by excessive suppuration is subsequently detached and cast off. From the very beginning of the ulcerative process an active inflammatory plastic condition in the form of a slightly hard swelling becomes manifest. This proves microscopically to be papillary cell-infiltration, and causes the delimitation or the demarkation of the chancroid.

Pathology of the Soft Chancre.

In the soft chancre, as in every other kind of suppurating sore, a distinction may be made between the base and edges of the ulcer. The transition between the border and bottom may be very sharp. Ulcers whose bases are on a level with their edges are called superficial or flat chancroids: they resemble more or less lardaceous, yellowish excoriations.

The base of the ulcer is uneven; it has a jagged appearance, like worm-eaten wood. This uneven appearance is due to the fact that some portions of the tissue attacked in the ulcerative process resist the sloughing action more than others. The surface of the chancroid usually has a yellowish or lardaceous appearance produced by the fatty degeneration or

molecular disintegration of the tissue-elements. Sometimes we find upon the surface of the sore a whitish-gray or greenish coating, if it contains any coloring-matter of the blood, similar to the pseudo-membrane of diphtheritis of the fauces, and, like the latter, adhering tenaciously to the structure beneath. Such chancroids are called *diphtheritic* chancroids. They originate from intense infiltration of the connective tissue of the soft chancre with newly formed cells, which compress the capillaries of the cutis or mucous membrane and interfere with their nutrition. The diphtheritic layer is necrosed tissue in the form of a slough. This slough, when the sore is about to heal, is surrounded by a fissure—the so-called line of demarkation, which bleeds slightly, and is a result of the inflammatory reaction that has taken place in the outskirts of the dead material. The matter that forms from this inflammation accumulates between the sound tissue and the slough, and finally is thrown off. A diphtheritic chancroid generally causes greater destruction of tissues.

In many cases the base of the ulcer exists only for a very brief time, as in a soft chancre that perforates the frænum or labia minora. Those parts which before the perforation formed the borders of the chancroid, afterward constitute its base.

The base of the sore furnishes a secretion which consists partly of molecular matter, fatty degenerated tissue-détritus, and partly of pus-corpuscles in which generally some blood-globules are mixed. In places provided with numerous sebaceous glands, the discharge will become mixed with rancid sebum, and acquire a most offensive odor, as in chancroids of the fossa coronaria.

The anatomical process of healing is as follows: Deep in the tissues on which the chancroid is located a marked degree of development of the vessels takes place. These markedly vascular tissues are the germinating soil of granulations or minute warts. These granulations may develop sparingly or in large numbers. Those which sprout in a normal manner form a velvety covering which is gradually transformed into cicatricial tissue. In some cases the granulations proliferate so abundantly that the bottom of the sore rises above its edges (ulcus elevatum, fungosum, frambœsoides).

The margins of the chancroid, in most cases, are thickened and swollen, because the papillæ of the cutis involved are infiltrated with cells. The cells that have accumulated here, however, degenerate as rapidly as those at the bottom of the sore; hence also is seen the markedly dentated and undermined condition. When healing begins, the margins of the ulcer become adherent to the base by the growth of granulations, and then they become level with it. As a result of the stimulated enlargement of the cutis-papillæ, a marked proliferation of the epidermis begins, which goes on toward the center of the ulcer. Cicatrization of the chancrous ulcer will progress rapidly or slowly, according to the character of its edges. The less they are undermined, the smoother and flatter they are, the sooner may they be expected to cicatrize. Hyperæmia and anæmia of the borders delay cicatrization. If the granulations under the edges of the ulcer sprout up too profusely, the margins will become raised up and everted to such a degree as to form a wall around it. From excessive plasticity of the cellular infiltration, this wall may become callous, so that the chancroid ulcer acquires a hard ring around it (annular chancrous ulcer). Outwardly, the borders of the ulcer, so long as the destructive process goes on, are surrounded by a red hyperæmic zone. With the subsidence of this hyperæmia, the destructive process also subsides, and then the granulations begin to grow beneath the undermined margins. The acute zone abuts against apparently normal tissue—we say apparently normal, because it is impossible to know how extensively the tissues around a soft chancre are morbidly altered by the ulcerative process.

Course, Duration, and Cicatrization of the Soft Chancre.

The destructive process in a soft chancre varies considerably as regards duration. In one case its progress is rapid, in another it is very slow. In one case the ulcer barely attains the size of a lentil, in another it becomes remarkably large. Now, the superficial surface of the papillary layer is barely destroyed (flat chancroid); and again not only the entire thickness of the cutis is perforated, but even the subcutaneous and submucous tissue is involved in the destructive process, where-

by sometimes entire organs, such as the glans, urethra, or labia, are destroyed. The tendency to gangrenous suppuration is not due to any specially specific infectious character of the discharge, but to a peculiar idiosyncrasy of the individual affected, although it can not be denied that in scrofulous and tuberculous persons, and those suffering from hunger and want, a soft chancre, as a rule, will grow to larger proportions than in healthy individuals. The depth to which the virus of a soft chancre, by infecting, may penetrate into the tissues, and the pus contained in the discharge from an infecting chancroid, seem to exercise greater influence upon the destructive process than the condition of the patient. But, in addition to the habits of the individual, local and external influences must be taken into consideration. The pus that is allowed to remain too long a time upon the surface of the chancroid not only acts as an irritant and is destructive to the granulations, but it also infects the parts in its vicinity. Arterial and venous hæmorrhage at the site of the sore favors the tendency to further ulceration. Mechanical injury of the sore, such as tearing and rubbing, chemical irritation from improper remedies, soiling with physiological secretions and pathological excretions, exercise similar unfavorable influences.

In those cases in which none of these injurious influences obtain, the destructive process generally lasts from four to five weeks, and cicatrization requires about fourteen days more. The infectious property of the treated or untreated chancroid diminishes gradually as the granulations form on its periphery. The cicatrix alone does not fill up the space formed by the loss of substance; the ulcer diminishes in addition through the retraction of the skin. The shallower the ulcer, the less marked will the scar be. For a time the fresh scar is hyperæmic, discolored, and slightly resistant; after a while, however, it becomes pale and supple. The scar of a soft chancre, as a rule, does not break open again.

Varieties of Soft Chancre.

An *erethistic* and an *atonic* chancroid are distinguished according to the degree of the inflammatory irritation of the tissue involved in the suppuration. In the former there is a

marked inflammatory condition of the surrounding parts; in the latter, the inflammatory reaction is absent, the discharge is slight and thin, the granulations grow very slowly, are dry, granular, and bleed easily.

If a more intense degree of inflammatory phenomena appear in the vicinity of a soft chancre of the skin, an erysipelatous swelling will ensue. However, intense inflammation may give rise to stasis, by which not only the parts involved in the ulcerative process become necrosed, but also the parts adjacent. These varieties are called *gangrenous chancroids*, and this designation is especially applicable to those with black sloughs, in contradistinction to those that are covered with a yellowish-white pseudo-membranous diphtheritic coating (called by Wallace *ulcers with white gangrenous sloughs*).

If molecular necrosis comes on with unusual intensity, and if it progresses with such rapidity as to destroy a comparatively large section of tissues in a few hours, we have to deal with a variety of soft chancre that has long been known as the corroding or *phagedenic* chancroid. But even in this kind several varieties are recognized, such as the phagedeno-diphtheritic, the *simple phagedenic*, and the *serpigino-phagedenic* chancroids. The first occurs when one of the layers of sloughed tissue forms a lardaceous pseudo-membrane that adheres firmly to the surface of the ulcer. Phagedenic sores are called simple when they spread uniformly in every direction, and the serpiginous forms are those which, while spreading in one direction, form granulations in another. In regard to the serpiginous-phagedenic chancroid, we again distinguish a false and a true serpiginous variety. The first kind spreads only downward toward the depending parts of the organ affected, and is due to a want of cleanliness; the second generally extends upward. The false serpiginous form really depends upon repeated autoinoculation. In these cases the initial chancroid is always situated at the highest point, while the newly formed sores occur at the lower and depending points. This kind of apparently serpiginous soft chancre is generally seen in the fossa corona glandis and on the inner surfaces of the labia majora.

The simple phagedenic chancroid occurs far more frequently than the serpiginous variety.

Phagedæna is apparently entirely due to the condition of the system, for these forms of soft chancre are found especially in weak and depraved individuals. The mode of life of these individuals is another very frequent cause. The abuse of spirituous liquors is an especially potent factor which seems to favor the production of the phagedenic condition; hence Ricord assumed the existence of an ulcus oniophagedænicum. Active mercurial treatment, coexisting scrofula, tuberculosis, or anæmia—in short, all the influences which tend to undermine the system, particularly favor the production of the phagedenic condition. The long duration of the soft chancre, and the equally long persistence of the infecting property of its secretion, are marked peculiarities of this form of the disease.

Site of the Soft Chancre.

A chancroid may occur on any part of the human integument and mucous membrane that can be reached by contact. However, since most soft chancres are acquired through sexual intercourse, it is easy to comprehend why the majority of them must occur upon the genital organs of both sexes. But there are also other places of the human body upon which chancroids are often met with, though not, however, as often as on the genital organs. Thus, injuries on the fingers of physicians and midwives constitute points of insertion of the chancrous virus. Wet-nurses affected with chancres on the genital organs will carry the infecting poison to the moist nipples if they rub the latter with their fingers which have been soiled with the discharge from the sore. In those given to the practice of sodomy, the soft chancre may form upon the lips, the tongue, mucous membrane of the rectum, etc. Numerous cases have convinced us that the statement which Ricord made long ago, to the effect that the head was proof against the soft chancre, is incorrect. Chancroids discharging profusely are apt in uncleanly persons to produce, by auto-inoculation, multiple soft chancres. The experiments of syphilization have shown that hundreds of soft chancres may be produced in the same person.

Any part of the integument of the penis from the free border of the prepuce to the mons veneris may afford a site for a soft chancre. The prepuce, however, is the part that is

most frequently attacked, especially its anterior or free margin, its inner surface, the frænum, the corona glandis, and less frequently the external meatus of the urethra; but the scrotum is also occasionally the site of the soft chancre.

In the female the soft chancre is most frequently met with upon the labia majora and minora, on the posterior vaginal commissure, and at the vulvar orifice, more rarely in the vagina and vaginal portion of the uterus. In unclean women, suffering from soft chancres on the genital organs with profuse discharge, the matter coming in contact with excoriations around the anus will convert the latter into chancroids.

The peculiarity, situation, and functional activity of the tissues, spoken of here, on which a soft chancre is apt to occur, exercise a greater or lesser degree of influence upon the development and course of the chancrous sore.

Chancroids of the prepuce are very obstinate and difficult to cure, because the foreskin is frequently stretched in its movements over the penis, and the sore is prevented from healing. In addition, it is apt to become soiled by the urine and the glandular sebaceous secretion. In congenital phimosis, or that acquired from temporary swelling of the prepuce, the preputial chancroid is even more frequently and more markedly exposed to mechanical and chemical injuries. Soft chancres of the mucous membrane of the prepuce usually become complicated with catarrh of the glans and of the prepuce. Preputial chancroids often give rise to chancroids on the glans through infection by contact. In cases of marked contraction of the preputial opening, such a degree of disturbance of the circulation occurs as to produce gangrene of the foreskin and glans. Impending gangrene of the prepuce manifests itself in the following manner: The patient complains of severe pain in the affected part, the prepuce swells enormously, becomes red, has a high temperature, and a foul-smelling, purulent discharge flows from the preputial orifice. If the impending dangerous condition is not quickly subjugated by appropriate treatment one or more blue spots appear on the external surface of the prepuce. In a few hours they become transformed into a black gangrenous slough, which after a while is cast off. The gangrene either limits itself to one or

several points on the foreskin, an opening forms, through which the glans penis, till now imprisoned in the preputial pouch, is laid bare; or the gangrene sloughs away the entire prepuce, attacks the glans itself, and destroys the greater part of it. If the arteria dorsalis penis is corroded by the sloughing process, dangerous hæmorrhage may supervene, as ligature of the vessel involved in this gangrenous process almost always proves futile.

Chancroids of the *frænum* are situated either on one or both sides, or on the margin of this membrane. In the two former conditions, perforation almost always takes place. The perforated spot, as a rule, cicatrizes very slowly and very rarely. In most cases, the bridge of the skin that has remained intact breaks down, often causing serious hæmorrhage from the arterial twigs that run along the free margin of the frænum, that is difficult to arrest. Usually, the frænum is entirely destroyed, and an ulcer results, that extends from the point of attachment of the frænum, near the fossa coronaria, to the urethral orifice, and from this point it may even encroach upon and attack the mucous membrane of the urethra. Soft chancres at the margin of the frænum spread very quickly in the loose connective tissue existing between the two lamellæ of that part; may lay bare the urethra, and even perforate it. They are the most frequent cause of swelling of the inguinal lymphatic glands.

A chancroid may occur on any part of the *glans penis*. In coexisting contraction of the preputial orifice, chancrous impressions will result on the mucous layer of the prepuce; and when cicatrization ensues, the foreskin may become firmly united to the glans. In the shallow pits or crypts which are found on the dorsum of the glans penis, and which are the rudiments of the sebaceous follicles that exist here in the embryonal state, soft chancres assume the shape of follicular ulcers. Superficial chancroids cicatrize very quickly. If the chancrous destructive process penetrates into the corpus cavernosum glandis, and assumes a phagedenic character, it may destroy such a large portion of the glans, owing to the spongy and vascular nature of the tissues, as to result in actual mutilation of the organ. In consequence of the exceedingly thin layer of the subcuta-

neous connective tissue, the cicatrization of such chancroids progresses very slowly.

Chancroids of the *external meatus urinarius* are situated either upon one or both lips, and thence may spread into the urethra. After cicatrization has taken place, the ostium externum urethra (the orifice) acquires a funnel shape. We have never, either during the life of the patient or at the autopsy, met with chancroids that have originated within the urethra behind the fossa navicularis.

The numerous sebaceous glands existing in the fossa coronaria glandis become diseased from the action of the chancrous poison, and assume the form of acne-like tubercles. These are transformed into ulcers of the size of a millet-seed, and may surround the entire fossa coronaria, like a string of pearls. Finally, even the sound parts between the ulcers are destroyed, and they then coalesce into one ulcerating groove. If such a follicular ulcer spreads to and attacks the subcutaneous connective tissue of the dorsum of the penis, a fistulous track from the fossa coronaria to the mons veneris will result.

In the female, soft chancres at the posterior commissure readily become phagedenic or gangrenous, because the physiological secretion and pathological excretions produced in the uterus and vagina, as well as the urine, are liable to accumulate there. As a rule, chancroids on the os uteri are not disposed to attack the deeper tissues; nevertheless, marked loss of substance and serious hæmorrhage have been observed.

Differential Diagnosis of the Soft Chancre.

The soft chancre may be mistaken for herpes on the genital organs, for an ordinary sore, the initial lesion of syphilis, and the cancer-ulcer.

It is only possible to mistake a chancroid for *herpes* on the genital organs during its initial pustular stage. The distinctive features of the two are as follows: The herpes vesicles generally appear in groups; soft chancres commonly only one at a time. The former are barely as big as a pin's head; the latter, as a rule, are larger. A group of herpes vesicles has one common, erythematous red base; each soft chancre is surrounded by a marked, slightly infiltrated red zone that is per-

ceptible to the touch. The herpes vesicles may exist for several days before bursting; the chancrous pustule breaks in ten or twelve hours after it has made its appearance. The ruptured herpes vesicles dry up, without undergoing ulceration, forming a thin orbicular scale corresponding to the old vesicle. After the bursting of the chancre-pustule, a loss of substance ensues that has a tendency to spread. A chancroid always leaves a depressed cicatrix after it which lasts for a variable period; herpes leave cicatrices that are visible but a few days, and indistinctly depressed or discolored. Herpes of the genital organs, in most cases, is an habitual disease, which may come on without or long after sexual intercourse. The pustule of a soft chancre begins about twenty-four hours after a suspicious cohabitation or infection with chancrous discharge.

Lacerations and *excoriations* originating after sexual intercourse may, from neglect of cleanliness or improper treatment, assume an ulcerating character, and then be mistaken for chancrous ulcers. The course of these sores, or inoculation performed with their secretion, will quickly dispel all doubt. Ordinary ulcers heal readily enough when kept clean and properly managed; and a pustule produced by inoculation with their secretion soon dries up and heals.

The most important point in reference to the *prognosis* is the *differential diagnosis* between a soft chancre and the *initial syphilitic ulcer*. The syphilitic initial lesion rests upon a marked, sharply defined cellular infiltration, which bears no relation to the slight ulceration and suppuration. The soft chancrous ulcer is seated upon a base that has become somewhat resistant in consequence of the reactive inflammatory process. The initial lesion of syphilis, when grasped between the thumb and index-finger, shows the consistence, resistance, and elasticity of fibroids and enchondromata. The soft chancre, pinched up in a fold between the thumb and forefinger, will have at the most an œdematous or doughy feeling. Only tardy or repeatedly cauterized soft chancres, situated in the sulcus coronæ glandis and genito-crural fold, sometimes occasion a temporary indurated inflammation of the connective tissue that may be mistaken for the hard consistence and elastic resistance characteristic of the syphilitic tissue induration.

In the soft chancre the inflammatory induration disappears spontaneously in a comparatively short time, and is not attended by hard, indolent swelling of the lymphatics. The syphilitic infecting ulcer is distinguished by its hyperplastic adventitious structure; the soft chancre is pre-eminently a destructive process. The syphilitic primary lesion, as a rule, develops very slowly, and, after a protracted incubation period, the soft chancre appears within a few hours or days after intercourse. The ulcerating process in the initial lesion of syphilis attacks layer after layer of the indurated deposit, the necrotic process proceeding from without inward, owing to the intense cellular infiltration. The capillaries in the part then become occluded, and the uppermost layer of the neoplastic formation dies for want of a blood-supply; consequently, the discharge from this lesion is very slight. The ulcerative process of the soft chancre proceeds rapidly, constituting a purulent dissolution of the tissues; hence the discharge is quite profuse. Primary syphilitic lesions resembling erosions occasionally cicatrize so rapidly that they entirely escape observation; in the soft chancre such rapid cicatrizations never occur. The scar of a syphilitic sore is hard to the feel, because the hyperplastic deposit remains for a long time; the scar of a soft chancre never becomes hard. The cicatrix of a primary syphilitic chancre often breaks open again; that of a soft chancre hardly ever. The cellular infiltration of a syphilitic primary lesion, after being absorbed, may reappear after a long while without the recurrence of infection (repullulation of the syphilitic initial sclerosis); in the soft chancre such a condition never takes place. In the cicatrized syphilitic Hunterian induration, deep depressions originate, as a result of atrophy; in the scar of the local venereal chancroid, such depressions are never observed. Indolent swelling of the lymphatic glands and diseased condition of the lymphatic vessels, as a rule, are the accompaniments of the initial lesion of syphilis, and seldom undergo suppuration; as a result of the soft chancre, however, the lymphatic vessels and glands are quite often affected (in twenty out of one hundred cases), and generally they undergo suppuration. Although we have enumerated here certain peculiar features and differences of form, and laid

stress upon the essential distinctive symptoms for the purpose of specializing the characteristics of the soft chancre and the primary lesion of syphilis, still, to be candid, we must admit that here, as in other instances of natural phenomena, exceptions and peculiarities of condition sometimes occur. The initial sclerosis may be indistinct, or the indolent swelling of the glands may be absent altogether, and yet a chancre may be followed by syphilitic manifestations.

It is much easier to mistake a soft chancre for an *epithelial cancer*, as the latter very often occurs on the prepuce, glans penis, and scrotum, and is frequently attended by suppuration of the adjacent lymphatic glands. Epithelial cancer generally occurs in the form of a papillary, wart-like growth, which soon becomes necrotic, and gradually attacks the deeper structures whereby the textures upon which it is situated soon become eroded (ulcus rodens). Cancerous ulceration progresses more by death of the upper cell-strata of the deficiently nourished skin than by suppuration. Hence, we usually find here flat erosions whose upper surface is tolerably *dry*. Now, while the base of the ulcer purifies itself, new papillary growths originate on its borders, by the death of which the destruction of the tissues spreads farther and farther. From these papillary growths, comedos or sebaceous plugs, consisting of flat or cylindrical epithelial cells, may be pressed out, through the proliferation of which the skin and subcutaneous tissue are destroyed (Klebs).

Prognosis and Treatment of the Soft Chancre.

The prognosis of a soft venereal ulcer depends (1) upon its location, and (2) upon the state of the inguinal lymphadenitis.

In regard to its *location*, some kind of chancroids, especially phagedenic and gangrenous forms, cause greater destruction and mutilation of the parts than others. Arterial hæmorrhages may take place from erosion of the arteria dorsalis penis and of the arterial branches in the frænum, and cause considerable trouble.

In regard to the occurrence of inflammation of the inguinal lymphatic glands, experience has shown that in twenty out of one hundred cases of soft chancres suppurating adenitis of the

groin takes place, that it occurs more frequently in the male than in the female—in the male, especially when the chancroid is situated on the frænum and on the internal surface of the prepuce; and in the female, in consequence of the chancroids occurring in the lacunæ on both sides of the urethra. In regard to the affection of the inguinal lymphatic glands, small, rapidly cicatrizing chancroids do not admit of a prognosis that is more favorable than other varieties.

The treatment of the soft chancre is either prophylactic or abortive, curative or methodical.

Prophylactic Treatment.

Besides the condom we have no remedy or agent that will protect one against receiving the virus of a chancroid, or will render it harmless to the system after it is brought in contact with some part of the living cutis or mucous membrane. Even the highly praised lotions which have been recommended to be used immediately after exposure to a suspicious intercourse, prove entirely useless in very many cases. By thoroughly washing the genital organs immediately after cohabitation, we may succeed in removing any infecting substance that may have been lodged there, and in this way we may probably, but not positively, prevent the virus from taking root and exercising its effects.

Abortive Treatment.

Ricord succeeded in preventing the further development of the chancroid pustules which he had produced by inoculation by timely cauterization, thus bringing about cicatrization and healing, and thereby obviating the extension of the disease to the adjacent lymphatic vessels and glands. It was found, in the course of experience, that the pustules of soft chancres, and of erosions contaminated with the pus of a soft chancre, if thoroughly destroyed within seventy-two to ninety-six hours after infection had taken place, will be arrested in their further development. But if a longer time than that just mentioned has elapsed since exposure to the action of the virus, or if an adjacent gland is already attacked by inflammation and swelling, cauterization of the infected spot will be entirely useless.

To be effectual, the caustics must also destroy sufficient adjacent sound tissue. For this purpose a great variety of caustics has been recommended. Nitrate of silver, caustic potassa, pure or combined with unslaked lime (Vienna paste), or Filhos's caustic (equal parts of caustic potash and unslaked lime cast in molds like a pencil), chloride of zinc, fluid, or combined with some simple substance in powder (pulv. secalis or pulv. rad. liq.), as Canquoin's paste, or in the form of pencils recommended by Köbner (zincum mur., gram. 1 [grs. xvj], kali nitric., 0·20 to 0·40 [grs. iij to vj], melted and quickly wrapped in tin-foil and preserved in glass tubes or bottles), butyr. antimonii, chloride of mercury, 0·50 to 5·00 or 10·00 water [grs. vij to ʒiv or ʒij, ʒij], sulphuric and nitric acid, and the actual or galvanic cautery. In the abortive treatment we only employ nitrate of silver in stick or a concentrated solution (a saturated solution is eleven parts of the nitrate to ten of water). This solution destroys the tissues that are impregnated with the chancrous virus more effectually than the solid stick of nitrate of silver. No wet compresses should be applied to the cauterized spot; it should be kept dry, for the purpose of keeping the eschar produced by the caustic from dissolving and flowing over adjacent parts. After the slough produced by the caustic has been cast off, some astringent preparation may be applied by means of cotton-wool compresses.

The part on which the virus of the chancroid has been lodged may also be excised. But, in the first place, the operation can not be carried out in every case; and, secondly, it is not always effectual, because we are not sure when the chancrous poison ceases to be active, nor to what extent the incision should be made around the affected spot.

Curative or Methodical Treatment.

If the abortive treatment has failed, if more than five days have elapsed since infection took place, if one or more of the adjacent lymphatic glands is already irritated or inflamed, the methodical or curative treatment should be instituted. It has to fulfill the following objects: To prevent the extension of the ulcer in breadth and depth; to protect adjacent parts against auto-inoculation; to promote the cicatrization of the

ulcer; and to check the swelling and suppuration of the neighboring lymphatic glands. These objects are attained partly by appropriate regimen and conduct on the part of the patient, and partly by proper local treatment.

The patient should avoid all active exercise, such as fencing, riding, dancing, etc. If there are already signs of active inflammation in the affected parts, especially if any of the glands of the vicinity are tender or painful, the patient will do well to go to bed. His diet should be light, spirituous or other stimulating drinks should be interdicted, or at the most allowed in moderate quantities, and only to those accustomed to their use.

The chief indication in local treatment consists in keeping the affected parts scrupulously clean, which is best accomplished by the speedy removal of the discharge from the sore, by protecting it from contamination with physiological secretion and pathological excretion. This is best achieved by repeatedly washing the diseased part (topical baths), and by the application of iodoform.

Iodoform in powder should be dusted upon the ulcer, and a bit of absorbent cotton dipped in a two-per-cent solution of carbolic acid in water, and squeezed out well, is then applied. To prevent the dressing from becoming too dry, it should be covered with a piece of gutta-percha, and the whole secured by a bandage. This dressing must be renewed two or three times a day, according to the quantity of the discharge. If the penis is markedly swollen, the patient should be confined to bed, and the organ kept upon the abdomen. In the majority of cases the ulcer becomes clean in a short time under this treatment. If granulations have begun to form, the iodoform dressing may still be used, or only a carbolic-acid solution; or, still better, empl. hydrarg. may now be substituted for either, especially if the patient desires to leave the bed. Exuberant granulations should be repressed by touching them from time to time with the solid nitrate of silver, which will also expedite the cicatrization of the sore.

If under this treatment the ulcer remains stationary, and, still more, if it enlarges markedly and rapidly, which is a most unusual circumstance, or assumes a diphtheritic character; if

the discharge is profuse, and granulations are slow to appear, one of the following preparations should be resorted to:

℞ Cupri sulphurici, 0·50 [grs. viij];
Ung. elemi., 50·00 [℥ iss., ʒ v]. M. Ft. ung.

A bit of this salve, of the size of a lentil, is smeared upon a small strip of muslin and applied to the ulcer two or three times a day, after bathing the organ in tepid warm water. In diphtheritic or phagedenic chancroids, that do not heal under the application of iodoform, an emulsion of camphor, caustic potash, or nitrate of silver, with balsam of Peru may be employed—like the following:

℞ Camphora, 5·00 [ↄ iv];
Mucil. g. arab.;
Aqua destil., āā 50·00 [℥ j, ʒ vj]. M.

℞ Kali caustic, 0·10 [grs. jss.];
Aqua destil., 50·00 [℥ j, ʒ v]. M.

℞ Argent. nitrici, 0·10 [grs. jss.];
Balsam. Peruvianæ, 30·00 [℥ j]. M. Ft. ung.

In ulcus luxurians or elevatum [fungous], a strong astringent, or mild caustic, should be resorted to.

In dry granular ulcers, with callous edges and scanty secretion, lint moistened with glycerine, or the empl. hydrarg., should be applied.

In phagedenic soft chancres general treatment will be necessary in addition to the use of local remedies, because the phagedæna in all probability is due to scrofula, tuberculosis, anæmia, scorbutus, habitual digestive disturbances, etc. It will, therefore, be necessary to resort to the remedies most effectual in the treatment of these various diseases. Mercury is to be strictly avoided in the treatment of phagedæna. We have rarely succeeded in arresting the progress of phagedæna by caustics, but we are able to recall numerous instances in which we obtained the happiest results from the use of acetate of lead or citrate of iron, combined with tincture of opium. In simple phagedenic chancre we therefore recommend—

℞ Ext. saturni, 2·00 [grs. xxxij];
Aqua destil., 100·00 [℥ vjss.];
Tr. opii comp., 5·00 [ↄ iv]. M.

℞ Citr. ferri, 1·00 [grs. xvj];
Aqua destil., 100·00 [℥ vjss.];
Tr. opii comp., 2·00 [grs. xxxij]. M.

One of the most reliable remedies, besides iodoform, we found to be a mixture of chloroform and glycerine, one part to six. The tartrate of iron, one part to six, is recommended by Ricord as a specific against phagedæna.

Excision of the phagedenic chancroid, at the most, can only be recommended when it is situated upon the frænum, the free margin of the prepuce, and at the edges of the labia majora or minora.

In the treatment of gangrenous chancroid it will be necessary first of all to ascertain the causes that brought about the gangrenous condition. These are apt to be: Grave stasis, a profuse flow of blood in the phlegmonously inflamed part, and mechanical obstruction to the return of the blood, when the supply is excessive; this may occur as the result of pressure, strangulation, phimosis, and paraphimosis. In any event, rest in bed should be recommended, ice-cold applications made, and in men the penis should be kept upon the abdomen, for the purpose of diminishing the supply of blood to the part, and accelerating its return. In congenital or phlegmonous *phimosis*, in which the retraction and extension of the prepuce for the purpose of cleansing the parts cause intense pain and irritate them, besides rendering the chancroids almost inaccessible and preventing the local application of remedies, it will be more advantageous to split the prepuce, or to perform circumcision. Arterial hæmorrhage caused by gangrene must be arrested by the application of the ligature, compression, or transfixion. If these methods fail, chloride [or persulphate] of iron, or the actual cautery, should be used. In all cases of phimosis, where there is no danger of gangrene, and the patients decline to be circumcised, injections of solution of nitrate of silver should be made into the preputial pouch four or five times a day, and retained there for a few moments. Or, after injecting water into the pouch, and then drying it as well as possible, the glans should be cauterized by inserting a solid piece of nitrate of silver between it and the prepuce, and rapidly rubbing it all over. After the injection or cauterization three or four pieces

of compressed sponge, each about two and a half centimetres long and two millimetres thick, according to the distensibility of the prepuce, should be inserted between the prepuce and glans, and renewed several times daily. In this manner the preputial sac is sometimes dilated to such a degree that after the cicatrization of the chancrous ulcers it can be retracted with the utmost facility. We do not recommend this method of treatment very strongly, preferring early circumcision for the relief of this complication.

In cases complicated with paraphimosis, circumcision will almost always be required. If the patient absolutely refuses to have it done, the penis is to be laid upon the abdomen, cold-water dressings applied to it, and attempts made to apply appropriate remedies, by means of camel's-hair brushes, between the folds of the constricting prepuce. If dangerous stasis, in consequence of the constriction, takes place in the prepuce or glans penis, the operation will have to be performed without further delay.

In chancroids of the ostium externum urethræ, it will be the duty of the physician to prevent contraction of the urethral orifice during cicatrization. This is best effected by inserting into the meatus plugs of charpie, or some other material, dipped in some resinous or other kind of ointment, or pieces of bougie, which should be secured to the penis by tapes and adhesive plaster, and which the patient may remove before micturition. Iodoform, made into sticks with some solidifying substance, is also very well adapted for this purpose.

Chancrous ulcers at the anus require prolonged washing and sitz-baths after each stool.

In perforating chancroid of the *frænum*, pledgets of lint, smeared with ointment of sulphate of copper, should be carefully introduced, several times daily, into the hole, or the perforation touched with the solid nitrate of silver. If the swelling is very great and the pain intense, dividing the bridge is the most appropriate procedure. Ricord has suggested an excellent measure for this purpose, by which the bleeding is avoided and the further progress of the ulceration restrained. Two waxed ligatures are passed through the opening, and are

then separately tied upon the bridge of the frænum, one thread after the other. The part between the two tied ligatures breaks down in a few hours or days, or it may be cut through at once, without fear of causing hæmorrhage.

In the *female*, scrupulous cleanliness must be enjoined, and carried out with even greater rigor than in the male, because the sebaceous and mucous follicles of the genital organs, owing to the presence of chancroids, are stimulated to hypersecretion. The discharge from the chancroid sores, and the secretion from the genital organs, flowing over the adjoining parts, will cause erosions to form at the genito-crural fold, on the perinæum, and around the anus, which soon develop into chancroids. Menstrual blood, the lochia, and vaginal catarrh, delay for a long time the cure of a soft chancre, if it is situated upon the vulvo-vaginal mucous membrane, and especially on the posterior commissure. Care should therefore be taken to cure the existing catarrh as soon as possible, sitz-baths taken often, vaginal douches repeatedly resorted to, and the sore frequently and thoroughly cauterized with the solid crayon of silver. This method is all the more applicable in the female, because the chancroids, in the vast majority of cases, are situated upon the mucous membrane, and bear strong cauterizations better than those in the male, situated upon the common integument. Aside from this, the treatment differs in no respect from that of chancroids in the male. Chancroids situated upon the upper part of the vagina or neck of the uterus must be cauterized through the speculum, with a long caustic holder. The parts that are likely to come in contact with a chancroid should be protected, by inserting repeatedly between them pledgets of wadding, saturated with some disinfecting solution, to prevent autoinoculation.

Diseases of the Lymphatic Vessels and Glands (Lymphangioitis and Adenitis) in consequence of Soft Chancre.

Daily experience has shown that the lymphatic glands, situated in the vicinity of a collection of pus or ichor, which are produced idiopathically or by infection, furthermore those in the vicinity of inflammatory deposits of a malignant nature, very often become inflamed and swollen. In some cases they

undergo resolution, but in others terminate in suppuration. These forms of swelling of the lymphatic glands are due to the agency of the lymphatic vessels, the fluids originating from the irritative lesions, indeed even viable cells and particles of dead structures, being taken up by them and conveyed to and deposited in the corresponding lymphatic glands. As a result of this condition only those glands become affected in which the diseased lymphatic vessels terminate, while the lymphatic vessels which run toward the primarily diseased spot undergo no perceptible morbid alteration. Occasionally, however, the morbid matter that has been absorbed also irritates the lymphatic vessels.

In many cases there is found a swelling of the thickness of a cord under the skin, upon the dorsum of the penis, running from the local sore to the nearest lymphatic glands. This cord-like swelling is nothing more than a lymphatic duct, thickened by coagulation of lymph, as a result of absorption of diseased fluids from the original lesion. This thickening of the lymphatic vessel may be ushered in with marked inflammatory phenomena, or without the least constitutional disturbance. Purulent urethral and preputial catarrh, erethistic ulcers, soft chancres upon the external genital organs, generally give rise to painful inflammatory swelling of the lymphatic vessels. Initial syphilitic lesions likewise produce disease of the peripheral lymphatic vessels; in the latter case, however, no inflammatory manifestations occur.

The first form of disease of the lymphatic vessels is called inflammatory; the second is spoken of as irritative. In both cases the affected lymphatic cord may be uniformly distended throughout its entire length, or knotty in one or more places. These lymphatic nodules are called *bubonuli*, while the swelling of the lymphatic glands is called *bubon*, or bubo. If the patient is carefully and properly treated, the affected lymphatic duct will regain its normal thickness. In the contrary event, and especially if the cause of the disease of the lymphatic vessel is a soft chancre, the inflamed nodules in the lymphatic duct will undergo suppuration. The integument covering the swelling of the lymphatic vessel ruptures, and a chancrous ulcer develops at this place. In swellings of the

lymphatic vessels, as a result of syphilitic initial lesions or of urethral catarrh, suppuration seldom occurs.

The affections of the lymphatic vessels of the external genitals, that have been just described, occur most frequently in the male on the dorsum or sides of the penis, and along the frænum. They are very seldom met with in the female, and then only on the labia majora. Disease of the lymphatic vessels which start from the preputial orifice may produce temporary phimosis. Lymphatic ducts that have undergone suppuration will require a much longer time to get well than would be required for resolution of non-suppurating inflammation. Affections of the lymphatic vessels and swellings of the lymphatic glands do not always have the same course and termination. The swelling of the lymphatic vessels may become absorbed, while that of the glands goes on to suppuration, or *vice versa.* Swelling of the lymphatic glands may originate without coincident swelling of the afferent lymphatic vessels, in the same manner as an epididymitis may occur without thickening and inflammation of the spermatic duct.

The morbid matter that has been transported to the glands does not always occasion inflammation in them; sometimes it only causes an irritation. In the course of the complaint this irritation may develop into a painful inflammatory lesion, *acute swelling of the glands*, or it causes, without any increase of the temperature and without any pain, an hypertrophy of the glands through increase of the hyperplastic element, forming *chronic* or *indolent* glandular enlargement. The acute or chronic state of the glandular swelling, and its future destiny, depend first upon the character of the morbid matter transported to the glands by the lymphatic vessels, and, secondly, upon the constitutional condition of the individual. If intercellular substance, pure, or gonorrhœal pus, originating from excoriated places, is transported to a gland in a person in all other respects perfectly well, an acute glandular swelling will be produced, which will either terminate in resolution or suppuration, according to the behavior and constitution of the patient. But if matter from a soft chancre in a state of acute inflammatory suppuration is conveyed to the gland, the latter will to a certainty undergo inflammation and

suppuration. If the discharge or the détritus of an initial or secondary syphilitic ulcer is conveyed to the gland, an indolent glandular swelling will result, which only undergoes suppuration when certain pre-existing conditions co-operate, or when a new irritation favoring suppuration is transported by additional matter. Of all the lymphatic glands in the human body, the glands in both inguinal regions are the most frequently affected in the manner described. All glandular tumors are now called *bubon*, because formerly the Greeks called the inguinal glands bubones, or buboes (*βουβῶνες*).

Physiologically considered, the glandular affection delineated above may be called *resolution buboes*. But, if the source of the absorbed fluid is taken into consideration, we might speak of *common*, *gonorrhœal*, *chancroid*, and *syphilitic* buboes. Further, since absorption-buboes are always preceded by some morbid alteration, they may be designated as *deuteropathic* or *secondary* buboes.

Protopathic or *idiopathic* buboes (*bubons d'emblée* of the French) are said to occur when the glandular hypertrophies were not preceded by any lesions of the adjacent skin or mucous membrane, and consequently did not originate by absorption of noxious matter. Cazenave, Vidal de Cassis, and Diday are even of the opinion that chancroid and syphilitic virus are capable of causing disease of the lymphatic glands without previously establishing any purulent foci on the skin or mucous membrane. Virchow maintains that all glandular hypertrophies are preceded by a lesion of some kind, and where none is found he asserts that it has disappeared, as in the so-called idiopathic adenitis, while the enlargement remains. He says, moreover, that in tender, irritable lymphatic glands, such as are generally found in scrofulous persons, any lesion which in a robust person would be of no consequence whatever is liable to produce the most severe and obstinate glandular swellings. We can not, however, refrain from expressing our opinion that, in consequence of constitutional conditions, such as scrofula, leukæmia, or syphilis, lymphatic glandular enlargement may originate without having been preceded by any lesions of the adjacent parts. These kinds of glandular hypertrophies are called *constitutional buboes*, or *adenitis*.

Buboes originating as a Result of Soft Chancres.

Swelling of the lymphatic glands, occurring in consequence of a soft chancre, generally soon undergoes suppuration. Owing to their rapid development, these buboes are called acute buboes, and, assuming that the pernicious matter that was conveyed to the glands was chancrous virus, *virulent* or *chancroid buboes*. However, even soft chancres may give rise to indolent disease of the glands. It is still a mooted point whether, in such cases, any chancroid pus has been absorbed, or whether other factors play a part. This form of indolent glandular swelling may, later on, after weeks or months have elapsed, assume an acute character, and in its subsequent course differ in no respect from those affections of the glands that are ushered in by acute symptoms.

A virulent bubo usually originates in the first week after the appearance of the soft chancre; sometimes, however, after the latter has completely cicatrized. This form of retarded adenitis indicates that the pernicious matter that has been absorbed is being slowly transported to the glands. But if such a glandular swelling does not undergo suppuration, or if, in case it suppurates, the pus by inoculation in persons unaffected with syphilis occasions no ulcer, we may assume that the chancrous sore, at the time the discharge was absorbed from it, no longer generated any virulent matter.

It is highly probable that by the absorption of the chancroid virus, at first, only one or a few glands are affected. The original size of the glandular swelling is barely as large as a pea. The swelling generally begins with severe pains, which are aggravated by the least pressure, and occasionally accompanied by febrile movement. Gradually the territory beyond the affected gland becomes sensitive, the skin covering the glandular tumor also becoming tender. Even the movements of the limb on the same side as the glandular swelling cause intense pain. The skin over the swelling gradually increases in redness, and it is difficult to pinch it up in a fold—a proof that it and the subjacent connective tissue have already become united to the affected glands. In the course of the disease the capsule of the suppurating gland bursts, the surrounding connective tissue imbibes the virulent matter, terminating in a

purulent fusion of the entire mass. A virulent or chancroid bubo is therefore generally a complication of suppuration of the connective tissue and of the lymphatic glands. After the pus has formed, the febrile phenomena usually subside, and the pains on moving the corresponding limb are less severe. Gradually the swelling points, the skin over it becomes livid red at the highest point, the epidermis peels off, and, finally, the abscess breaks and pus escapes.

Up to the point of rupture, adenitis originating from absorption of chancrous pus is analogous in its development to those lymphatic swellings of the glands that are caused by ordinary or gonorrhœal pus. In a patient who is suffering from gonorrhœa and chancroids at the same time, it is therefore impossible to say, before the inguinal abscess has broken, whether it originated from the absorption of the gonorrhœal or chancrous pus. After it has broken open it may be diagnosed as being probably a case of chancroid bubo. A positive diagnosis that the glandular abscess is a chancroid bubo, or, more correctly speaking, a glandular chancroid, can only be made from the course of the abscess, and the result of inoculations made with the pus from the abscess.

If the glandular swelling opens spontaneously, or is opened by the surgeon, a thick, cream-like pus escapes, like that from other acute abscesses; but, in chronic suppurating lymphatic swellings, thin pus containing cheesy particles, like that of cold abscesses, is discharged. If some of the matter from the abscess, taken indiscriminately, is inoculated under the skin, a pustule will form in some cases, which may become transformed into a chancroid ulcer; in others, again, it soon dries up and forms a crust. If, however, an inoculation is made with matter taken from the bottom of the abscess, from a spot where two or three niche-like excavations are found, the pustule produced will almost always be transformed into an ulcer. These excavations are distinguished by the fact that their bases appear to be more jagged and covered with a larger amount of molecular détritus than the rest of the bottom of the abscess. From all indications they are the depots of those lymphatic glands to which the chancroid virus was conveyed by the lymphatic ducts.

The opening of an abscess, however, does not terminate the morbid process that has become established in the glands and adjacent connective tissue, as is the case in ordinary abscesses of the glands, or of the cellular tissue; for instance, in gonorrhœal buboes, in which the latter, after being opened, quickly become smaller and cicatrize. The chancroid virus that was transported to the glands and connective tissue produces its characteristic effects here, as in a soft chancre of the skin. The bottom of the abscess secretes a thin, ichorous fluid, which corrodes the adjacent tissues, especially the margins of the abscess, undermining them and giving them a jagged appearance. An ulcer of the skin, which gradually enlarges and has the characters peculiar to a cutaneous chancroid, originates from this abscess. Sometimes the margins of the ulcer are undermined and almost deprived of nutrient vessels, livid in color, and slightly overlap the bottom of the ulcer. In other cases, the margins proliferate, and undergo a condition of sclerosis, becoming everted and forming a wall of cicatrized callosity.

A period of eight, ten, or more days may elapse from the time a virulent bubo begins until distinct fluctuation is felt. The softening which takes place sooner or later depends mainly upon the behavior of the patient and the care with which the chancroid is treated, and also upon his constitutional condition. Glandular chancroids require a longer time to run their course than chancroids of the skin or mucous membrane, because glandular tissue and connective tissue heal much more slowly than ordinary skin and mucous membrane. All forms of disturbances of nutrition, such as scrofula, tuberculosis, scorbutus, etc., exercise greater influence over the ulceration produced by a bubo than over a soft chancre of the skin.

In favorable cases, the abscess closes by the end of the fourth week after it was opened. During this period the open bubo may present all the morbid changes that are observed in a chancroid on the skin. It may be attacked by phagedæna, and the phagedæna may assume a serpiginous character. The surface of the ulcer may become covered with a diphtheritic membrane. Lastly, the bubo may also become gangrenous. The loose connective tissue in which the glands generally are imbedded is more readily destroyed by the inflammatory pro-

cess, and hence bubo-ulcers, especially the gangrenous variety, occasionally assume inordinate proportions. Fistulæ may form, undermining and destroying the tissues, and by eroding blood-vessels cause hæmorrhage that may endanger life.

The closing of a glandular chancroid takes place in the same manner as in a chancroid of the skin, partly by the formation of cicatricial tissue from the periphery toward the center, and partly by the retraction of the integument. Large glandular chancroids, however, do not cicatrize as quickly as soft chancres of the skin. At the bottom of the latter the tissues are of a homologous nature, while fascia, hypertrophied and ulcerating glands and lymphatic vessels forming arches and prolongations are found in a bubo. The glandular chancroid offers numerous conditions which are favorable to the decomposition of animal matter. Under the influence of general morbid conditions, such as hospitalism, or in consequence of irritating dressings and ointments, the proliferating granulations suddenly become pale, wilted, and collapsed, and undergo cheesy or gangrenous degeneration. Not only is the cicatrization interfered with by these morbid conditions, but the growth of pus-cells is greatly fostered.

The restitution of the epidermis, as a rule, progresses from the margins of the ulcer, or small islands of epithelial cells spring up at a distance from the margin.

Chancroid buboes occur more frequently in men than in women, owing doubtless to the fact that in the latter most soft chancres are situated upon the mucous membrane of the genital organs, and also because females, as a rule, lead a more quiet life.

Site, Shape, and Size of Chancroid Buboes.

As a rule, the glands situated nearest the chancroid become affected. The chancroid virus seldom overleaps adjacent glands and attacks those at a distance. Thus, in consequence of a soft chancre on the genital organs, the inguinal and femoral glands; on the lips or tongue, the submaxillary and sublingual; on the fingers, cubital or axillary, or also the jugular or subclavical glands of the corresponding extremity, become affected. The inguinal glands are not always affected on the

side corresponding to the situation of the chancroid on the genital organs. The soft chancre may be situated on the right side, while the inguinal glands on the left are diseased, or the reverse is the case. This fact is explained by the anastomosis of the absorbent lymphatic vessels. Chancroids situated upon the median line of the penis, especially those on the frænum, are apt to produce tumefaction of the lymphatic glands on both sides. Fissures in the folds of the mucous membrane of the anus, ulcers or furuncles on the tuber ischia or on the buttocks, likewise give rise to swelling of the inguinal lymphatic glands.

The glands found in the inguinal triangle are divided into the superficial and deep by the fascia of the region. The superficial glands are numerous, covered by the fascia superficialis, and lie imbedded in the meshes of adipose tissue; there are only three or four (sometimes only one) deep glands which lie directly upon the sheath of the femoral vessels.

The superficial inguinal glands are affected much more frequently than the deep, and when the latter are affected, in consequence of a soft chancre, it is not caused directly, but by imbibition from a superficial suppurating gland or the contiguous connective tissue. Suppuration of the deep glands is much more dangerous than that of the superficial ones.

The form of the glandular tumor is more distinct in lean persons than in stout ones, and thus it often happens that in women with pendulous abdomens no swelling can be seen, although they may have suffered from febrile phenomena and complained of pains in one of the inguinal regions for several days. Acute chancroid buboes vary in shape. Inguinal swellings of the lymphatics are generally elliptical; their principal axis is in a line with the inguinal fold. Axillary and jugular glandular tumors are usually round.

A glandular swelling formed by the inflammation of one gland only will present a smooth surface; but if several adjacent glands are involved, it will present, at least at the beginning, an uneven, hilly lump. This form of swelling of the inguinal glands not infrequently acquires a shape like a wallet, owing to Poupart's ligament being stretched transversely across it.

The size or circumference of the glandular swelling depends, above all, upon the constitutional condition of the patient. Thus, large buboes form in scrofulous persons when affected with chancroids. It seems that the chancroid virus in these patients causes more irritation and increase of hyperplastic exudation into the glandular substance than destructive action. Hence, under appropriate treatment, resolution of the bubo is soon achieved; but should purulent degeneration occur, which usually happens by the third or fourth week after the swelling has appeared, it will only affect the connective tissue surrounding the glands, while the glandular parenchyma escapes. In these cases, fistulæ often result. This kind of glandular inflammation is known as *strumous buboes.*

It is more difficult to demonstrate suppuration of the glands than of the subcutaneous cellular tissue, because the former are situated at a greater distance from the skin than the latter. In buboes formed of many glands, not infrequently cheesy degeneration or purulent foci develop, and gradually either coalesce into a common cavity or rupture separately, forming *multiple buboes.*

Differential Diagnosis and Prognosis of Buboes.

Buboes of the groin, *before they are open*, may be mistaken for an inflamed testicle that has been retained in the inguinal canal; for a strangulated or reducible hernia; and, lastly, for a varix of the vena saphena at the point where it dips into the vena cruralis.

The diagnostic features of a *non-descended inflamed testicle* are: The absence of one testicle from the scrotum; the peculiar pain on touching the swelling; and, lastly, its characteristic hardness. Glandular swellings, before pus has formed in them, are harder to the touch than a testicle. An epididymitis, in addition, is distinguished from a suppurating bubo by the absence of softening. The symptoms of a *reducible hernia* are: The tumor is soft, compressible, and becomes smaller when the patient assumes a horizontal position—larger when he stands, coughs, or sneezes. On pressing an enterocele, borborygmi are heard, and, attended by a gurgling noise, the prolapsed gut slips back into the abdomen. In *strangulated hernia* there

are, in addition to the general symptoms, colic-pains, flatulence, etc. The percussion-sound is generally tympanitic. Later, the symptoms of inflammation and the evidences of gangrene ensue, followed by vomiting of stercoraceous matter.

The characteristic symptoms of *varix* are: The rise and fall of the tumor, synchronous with inspiration and expiration, its increased tension when the saphena vein is compressed above it, and its collapse when the vein is compressed below it.

Open inguinal buboes are apt to deceive the physician by the similarity they sometimes present to *epithelial carcinoma* situated in the inguinal region. In regard to the differential diagnosis, we refer the reader to what has been said concerning the differential diagnosis between a soft chancre and epithelioma.

The character and ultimate result of a bubo can not be definitely decided at its commencement. It is only possible to infer from the existing or preceding chancroids that the beginning bubo is the result of absorption of the chancrous virus, and that it will inevitably suppurate. But if the chancroid was cicatrized long before the bubo began, we are justified in assuming that the pus from the soft chancre was brought to the glands at a time when the former was no longer virulent, and in this event suppuration need not necessarily ensue. The constitutional condition of the patient, his behavior, and the character of the chancroid, play an important part, and should be taken into consideration in forming a prognosis. In feeble, anæmic, scrofulous, tuberculous, and cachectic persons, the suppuration and cicatrization of a bubo never progress satisfactorily. Not infrequently they are interrupted by the supervention of a gangrenous, inflammatory condition of the subcutaneous cellular tissue, especially when the patient is confined in an unhealthy atmosphere—for instance, in a hospital. Violent exercise aggravates the inflammation and the tendency to suppurate. The greater the number of the glands affected, the larger the abscess will be, and the longer the cavity will take to cicatrize. If the soft chancre becomes phagedenic, the suppurating bubo will also assume a phagedenic character. Gangrenous buboes are exceedingly dangerous. The hyper-

plastic enlarged glands, having been deprived of their capsules, project into the cavity of the abscess and prevent its cicatrization.

Treatment of Diseases of the Lymphatic Vessels produced by Chancroids.

In inflammation of the lymphatic vessels of the dorsum of the penis, however it may be produced, the organ is to be put on the abdomen and wrapped in compresses dipped in ice-water. Suppurating bubonuli should be incised, and the open lymphatic abscess, if it has originated in consequence of a soft chancre, treated precisely like a chancroid on the skin. If evidences of inflammation of the lymphatic vessels appear, no irritating caustics or lotions should be applied to the chancroid.

Treatment of Buboes before they are opened.

The abortive treatment may be resorted to in the hope of arresting the beginning inflammation of the glandular and connective tissue, and of avoiding or limiting suppuration. In buboes caused by soft chancres it is seldom successful; it may prove more successful in contagious catarrhs of the urethra or the glands, in swelling of the glands due to a syphilitic initial chancre, or in cases in which a simple lesion in coexisting scrofula was the cause of the glandular swelling.

First of all, everything should be avoided that may increase the irritation of the glands. The patient must stay in bed; but, in torpid, strumous buboes of cachectic persons, moderate exercise in the open air is beneficial. Cold compresses should be applied to the glandular swelling, if it presents an inflamed rather than a hyperplastic indolent character; but if the least pulmonary catarrh be present, these applications should be made with the utmost caution. We have found the compress or T-bandage to be very useful in hyperplastic swelling of the lymphatic glands, for the purpose of encouraging absorption. Blisters, with or without the local application subsequently of a concentrated solution of corrosive sublimate, in our hands, failed almost entirely. In view of the pharmacodynamic action of iodine, the tincture of iodine may be em-

ployed for that purpose, painting the skin over the swelling with it by means of a camel's-hair brush. The irritating effects of this remedy may be diminished by the addition of an anodyne. We therefore order the following compound:

℞ Tr. iodine, 30·00 [℥ j];
Tr. belladonna, 10·00 [℈ viij].
M. S. For external use.

℞ Tr. iodine, 30·00 [℥ j];
Tr. gallar., 15·00 [℥ ss.].
M. S. For external use.

If the skin nevertheless becomes irritated, we order iodine plaster instead of the tincture, in the following manner:

℞ Iod. plumbi, 5·00 [℈ iv];
Emplas. diachyl. comp., 50·00 [℥ jss., ℈ iv].
Ung. elemi q. s. ut fiat emp. molle.

The plaster is spread upon muslin or soft leather, and applied to the glandular swelling. Iodine, after all, is best adapted to accomplish resolution in indolent strumous buboes. As the odor of iodine is disagreeable, we employ instead the *basic acetate of lead*, and have obtained at least as good results with it as with iodine. Compresses dipped in a solution of acetate of lead are applied to the swelling and changed several times a day, securing them to the parts with a spica bandage. Under this treatment the hyperæmia and redness of the skin disappear, and the swelling diminishes in size.

If, however, despite the application of the lead-water compresses, suppuration takes place, and fluctuation is detected, the pus must be evacuated under strictly antiseptic precautions. First, the hairs should be shaved off, the parts washed carefully, and while the operation is being performed a stream of a two-per-cent solution of carbolic acid should irrigate the parts. The abscess may be punctured with a sharp-pointed bistoury, or laid open by careful dissection with a scalpel in a line running along the inguinal fold. The latter course is especially recommended to the inexperienced. We have known instances in which very good physicians injured the arteria cruralis while puncturing a bubo. At first a small opening should be made: if no pus escapes at once, a blunt probe, pre-

viously dipped in the disinfecting fluid, should be inserted into the wound, and the little finger (also washed in the same fluid) being placed in the wound to ascertain by the sense of touch whether any important organs are in the way, the capsule of the gland, and the glandular substance itself, should then be broken up. If pus be present, which is sure to be the case when pressure with the probe at any one spot of the unopened glandular tumor causes very severe pain, it will soon flow from the wound. A director is then passed into the wound, and the cavity freely laid open. It is best to remove the undermined skin at once, in order to have a uniform wound without any pockets. Any divided blood-vessel must be tied. Particles of the disorganized gland should be *carefully* scraped away with the scoop.

After the operation is finished the wound should again be washed with a two-per-cent solution of carbolic acid, then dried with Brun's wadding, and powdered with iodoform; next, several layers of antiseptic gauze made into a compress and laid upon it are covered with a piece of gutta-percha cloth, and the whole secured by a spica bandage. This dressing must be renewed every day, and the subsequent treatment of the wound is conducted in accordance with the general rules of surgery.

The use of caustic pastes for the purpose of opening buboes has been discarded, as they are unsurgical.

In anæmic patients, in whom very little pus is present, we may first attempt to puncture the abscess with Graefe's cataract-knife, allowing the pus to escape, and then applying lead-water compresses. In this manner, in some cases, a cure was achieved, the skin that had already been raised by the pus again uniting with the parts beneath it.

The Treatment of Open Buboes.

A bubo that broke open spontaneously, or was opened with a knife, originating in consequence of gonorrhœa or an erosion, should be treated like an ordinary abscess of the lymphatic glands or connective tissue. But, if it be the result of a soft chancre still in full progress, it is to be regarded as a chancroid of the glands and cellular tissue, and treated like a soft chancre of the skin, taking into consideration, however, the location

and structure of the diseased foci. A glandular chancroid forms an ulcerating cavity in which pus mixed with tissue-détritus may easily accumulate. These cavities should, therefore, be washed out several times a day, either with a syringe or by irrigation, or by means of sitz-baths, in which the patient is kept for a long time. After this the cavities should be packed with pledgets of cotton dipped in a solution of carbolic acid or chloride of zinc, chlorate of potash, caustic potash, or, better still, powdered with iodoform. A spica compress bandage should then be applied. Hypertrophied glands, whose capsules have been destroyed, and which project into the cavity of the abscess, should not always be cut away. It is preferable to paint them several times a day with a weak solution of caustic potash or soda, or once a day with a concentrated solution of nitrate of silver. We have also seen good results from filling the cavity with a compound consisting of balsam of Peru, 20·00 [℥ ss., ℈ jv] and arg. nitric., 0·05 [gr. j]. Occasionally, we have derived much benefit by injecting once a day a little basic acetate of lead, with a Pravaz syringe, into the exposed hyperplastic enlarged glands. Hypertrophied lymphatic cords should be divided with the scissors, and callous margins of the skin removed. In commencing gangrene, we apply an emulsion of camphor, or fill the cavity of the abscess alternately with pledgets of cotton dipped in chloride of lime and with plaster of Paris and tar or iodoform, and cover the whole with ice-cold applications. If the gangrene can not be checked, the actual cautery should be employed, or the patient put into a bath. Lastly, the room occupied by the patient should be thoroughly and frequently ventilated, because in damp, dark, and badly ventilated rooms buboes readily assume a putrid character.

Fistulæ in consequence of Suppurating Buboes.

Fistulæ result either from the burrowing of pus, or they are the consequences of a progressive inflammation of the subcutaneous or intermuscular cellular tissue and of the cellular tissue of the sheaths of vessels and fascia. They run either superficially under the skin and fascia superficialis, or form sinuosities deep between the tissues. Fistulæ may last for

years, and thereby render the patient cachectic. The danger from them increases with their extent; those penetrating deeply are more dangerous than the superficial ones. Attended by inflammatory phenomena, an infiltrated swelling forms at the external end of the fistula, which soon becomes soft and breaks, in many cases at a distance from the original abscess. As a result of this burrowing, the fistulæ acquire a very tortuous course, having branches that lead in different directions, but are connected by one parent canal. They may become filled up with granulations whereby the lumen of their canals is plugged up. In consequence of these granulations, they may become cicatrized like cords, temporarily or permanently, or the walls are only lined with cicatricial tissue while the suppuration continues.

This variety of fistulæ may occur above and below Poupart's ligament. Those situated below Poupart's ligament become serious when they burrow beneath the sheath of the femoral vessels and between the abductors of the thigh, or when they extend into the lesser pelvic cavity along Gimbernat's ligament. The greatest danger in fistula appears when gangrene gives rise to erosion of some of the arteries—for instance, the circumflex.

To prevent fistulæ from forming, the physician will find it necessary to bring about a union of the undermined skin with the subjacent parts, or, by making a counter-opening, or, by freely laying open the abscess, to evacuate the pus. No fistulous tract should be laid open till all hopes of resolution are gone, and the inflammatory phenomena plainly indicate that pus has formed. With that object in view, cold-water applications should be made, and changed as often as they become warm, and the tract should be compressed with appropriate dressings and bandage.

The fistula may either be slit open with a scissors or bistoury upon a grooved director, or a ligature may be passed through and allowed to ulcerate its way out. The former method is better adapted in superficial, straight fistulæ—the latter in deep, tortuous ones. By the use of the ligature, hæmorrhage is avoided, which, in a patient already exhausted, may prove very serious. This measure, moreover, brings about

a more speedy closure of the tract than by slitting it open. The ligature may be either of silk well waxed, or an elastic drainage-tube.

By means of a probe armed with the ligature or drainage-tube, an effort is made to find the terminal opening of the fistula. If it terminates at a point on the skin in the vicinity, the instrument is pushed through, and one end of the ligature is brought out at the lower opening; but if the tract terminates blind, and the point of the probe is felt beneath the skin, the probe should be withdrawn, a grooved director inserted, and an incision made with a bistoury on its point; after which the probe, armed with the ligature, may be passed through the fistula. If the tract penetrates perpendicularly into the tissues, an effort should be made, by inserting into it compressed sponges, laminaria, or the like, to convert it into a funnel-shaped cavity, whose larger aperture is directed outwardly, and by the application of stimulating dressing make it close up. If this fails, a drainage-tube of the proper length and thickness should be inserted. Finally, by cleansing the fistula frequently, and by applying caustic or antiseptic remedies, such as weak solutions of caustic potash or carbolic acid, Lister's paste or iodoform, a union of its walls may be brought about. If a lardaceous membrane (fatty and molecular degenerated connective tissue) forms along the fistulous passage that has been laid open, pledgets of lint dipped in a weak solution of caustic potash, acetate of iron, iodo-glycerine, or chloride of zinc, should be applied once or twice daily.

SECTION III.

SYPHILIS.

General Conception.

By the term *syphilis* is meant a blood-poisoning, produced by a peculiar animal virus, as the result of which various morbid lesions, occurring in a more or less constant series, are occasioned in the different tissues of the human body, and in which the specific inflammatory products, and the blood from the affected person, when transmitted to other healthy persons, produce in the latter similar morbid effects.

Nature and Vehicle of the Syphilitic Virus.

The syphilitic contagion adheres to all textural elements and textural détritus produced by suppuration or bionecrosis in consequence of syphilis. It is most abundant in disorganized syphilitic papules and the sloughing initial sclerosis or hard chancre. The blood and semen of virile syphilitic persons do not seem to be totally, and at all times, tainted with the syphilitic element. In this way may be explained the variable results obtained from inoculations with the blood from syphilitic persons, and the fact that a syphilitic father will at one time beget a healthy child, and at another a syphilitic one. The milk, saliva, tears, and urine, do *not* seem to form a vehicle for the transportation of the syphilitic virus. Hence those pathological secretions that have no connection with syphilis—for instance, gonorrhœal discharges, the matter from eczema, the sputa of pneumonia in a syphilitic person—can only become infectious syphilitically when they are mixed with syphilitic blood or syphilitic détritus.

The contagion of syphilis, from all accounts, is a fixed principle. There is no such thing as syphilitic miasm. Neither the microscope nor chemistry has so far been able to furnish us with any more definite information regarding its nature. Some authors claim to have discovered a peculiar micro-organism which is present in the blood and the morbid lesions, and which engenders the syphilitic disease; unfortunately, however, the discovery still lacks confirmation.

The Transmissibility of Syphilis, or the Various Ways in which Syphilitic Infection may take place.

Syphilis may be transmitted either directly by contact with syphilitic tissue-elements or by procreation on the part of syphilitic parents. The manifestations of the first form are called "acquired" syphilis (*syphilis acquisita*), those of the latter hereditary syphilis (*syphilis hereditaria*). The contagion of syphilis being, as stated, a fixed principle, it begins to manifest itself at some given point, and thence infects the entire system. The infection of the system must be preceded by a solution of continuity, and it is entirely immaterial whether it is produced at the same time or some time before the syphilitic virus took effect. The uninjured epidermis, as a rule, forms a protection against infection by syphilis. In most cases the lesion and the infection take place through coitus, during which, by friction or maceration, the epidermis or the epithelial layer at some point on the genital organs is abraded, and the denuded spot on the skin or mucous membrane is readily acted on by the syphilitic virus. The virus may, however, also gain an entrance into the system through many other places—for instance, the mouth, tongue, cheeks, eyelids, forehead, nipples, fingers, etc. The transmission is either direct from a diseased to a well person, or it is indirect. The direct transmission of the syphilitic virus usually takes place during coition, kissing, wet-nursing, operations by surgeons, midwives, nurses, etc. The indirect infection may occur by utensils, cigar-holders, pipes, surgical instruments, bandages, etc. Even persons who are well may serve as agents in transporting the virus without becoming themselves affected, simply affording a temporary shelter for it at some place on their bodies—for instance,

in the vagina, or under the nails. The syphilitic contagion, under favorable circumstances, may give rise to syphilis in all persons who hitherto had not been affected with it. No age, no temperament, and, as it seems, no nation, have, as regards syphilis, any special immunity, nor again any special susceptibility. Syphilitic tissue-elements retain their powers of infection for a long but uncertain period; syphilitic papules, for instance, are capable of communicating the disease after many months.

Transmission of Syphilis by Vaccination. The Relation of Vaccine Lymph to Syphilitic Virus.

During the early part of this century many physicians reported numerous instances in which, in consequence of vaccination, hard, protracted, indurated ulcers formed at the site of vaccination, followed subsequently by syphilitic eruptions of the skin. The question now arises, How is the transmission of syphilis, in consequence of vaccination, brought about? Our opinion is, that syphilis can only be transmitted by vaccination when syphilitic germ-elements are transplanted at the same time with the vaccine lymph. These elements are the blood of a syphilitic person, and the molecular détritus, or the pus originating from syphilitic eruptions. We only agree in the opinion of Viennois in so far as to admit that in some cases syphilis may be transmitted by means of the vaccine lymph taken from a syphilitic person, when the vaccine virus becomes mixed with some blood from that patient. This manner of transportation also serves partially to explain the fact that, in the class of vaccinations in which blood has simultaneously been transported, only a few of the vaccinated became syphilitic. The experimental inoculations of healthy persons with the blood of syphilitics have shown that the results vary very much. Those inoculations in which some syphilitic blood was transmitted with the lymph taken from a normal vaccine vesicle correspond to those cases of vaccinal syphilis, in which a circumscribed, hard initial node formed at the place of vaccination after the vaccine vesicle had gone through the successive stages of normal development, dried into a crust, and subsequently fell off. Syphilis may, however, also be transmit-

ted in vaccinating with lymph, taken from a syphilitic person, and mixed with tissue détritus resulting from syphilitic disorganization. The results of the inoculations which Pick and Krause obtained by using the matter of bullous or pustular eruptions on syphilitic persons justify us in assuming that in patients affected with latent or florid syphilis, if vaccinated with cow-pock virus, a vesicle or pustule may be produced that gradually develops into a little ulcer. Now, such a vesicle situated upon a syphilitic patient may be mistaken for a vaccine vesicle, and its contents, if used, may serve as a means of transmitting syphilis; the disease is sure to be transmitted if some of the pus it contains is used.

This view also serves to explain the fact that in some cases the vaccinations failed, and yet at about the end of the third week after the person was vaccinated a circumscribed syphilitic sclerosis of the tissues developed at the point of vaccination.

The theory that vaccine lymph in its passage through a syphilitic system likewise becomes syphilitic, i. e., acquires the property of syphilis in addition to being cow-pox, is refuted by numerous vaccinations performed upon healthy persons by some of the most reliable investigators who used vaccine lymph taken from syphilitic patients, and invariably produced normal cow-pox—never syphilis. Were the cow-pox lymph of syphilitic individuals charged with the contagion of vaccine *and* of syphilis, every person that is successfully vaccinated with it would also become affected with syphilis. But this does not happen.

From the preceding remarks it is evident that the following rules should be observed in performing vaccination:

(1) The child from whom the vaccine virus is taken, and his parents, should be subjected to a most careful examination.

(2) In view of the fact that congenital syphilis rarely breaks out before the end of the third week after birth, no vaccine lymph should be taken from a child under eight weeks of age. (See Hereditary Syphilis.)

(3) No vaccine lymph mixed with blood or pus should be used under any circumstances.

[The surest way of avoiding transmission of syphilis by

vaccination is to discard humanized vaccine entirely, and use animal vaccine lymph only.]

Transmissibility of Syphilis to Warm-blooded Animals.

Whether syphilis can be transmitted to animals, and produce in them manifestations similar to those produced in man, is still an open question. While some investigators—for example, Klebs and Martineau—report successful inoculations in apes and hogs, neither Neumann nor myself succeeded in producing either a primary local effect or any other manifestation of lues by inoculating this class of animals with syphilitic pus or blood. In one ape whom we inoculated in three places on the back with the pus of a *soft* chancre, we succeeded in producing pustules which soon became converted into ulcers that healed within three weeks. Many similar experiments furnished us equally striking proof of the difference between a soft chancre and syphilis.

First Manifestations of the Action of the Syphilitic Virus.

The first manifestation of the action of syphilitic poison is presented at the spot where the virus was deposited and absorbed. The first external manifestation that appears at the place of infection varies, however, according as the syphilitic contagion is associated with an irritative factor, i. e., pus or ichor, or with some harmless fluid, such as blood, serum, or lymph. In the former event, there appears at the place a circumscribed hyperæmia and swelling, the latter passing in a few or several days into a condition of purulent softening or ulceration of the tissues. The swelling and suppuration appear there all the more quickly and more intensely, the deeper the solution of continuity through which the syphilitic virus took effect. The tissues, in persons who had not been previously affected with syphilis, do not assume for a long while at the place of infection those pathognomonic alterations which we would recognize as evidences of luetic infection. But if the infecting contagion was not combined with pus-cells, but only with such fluids as are usually secreted on the superficial surface of the sclerotic ulcer (*intercellular exudation*), or with the blood of a syphilitic individual; and, above all, if at the place of infection

there was no deep solution of continuity, but only a simple excoriation—no suppuration will take place, and the excoriation will heal quickly. After a longer or shorter period (*first period of incubation*), a nodule, varying in size, will form. At the junction of integument with the mucous membrane this resembles a moist papule that is just beginning to grow.

Repeated observations, however, have taught us that persons affected with latent, feeble syphilis, though having no syphilitic effects on any part of their bodies, may communicate the disease to their wives, although it is not possible to discover any initial syphilitic lesion in the latter, and have not become pregnant. In these women syphilis manifests itself by extremely rapid emaciation. In the further course of the disease they lose their hair; sometimes periosteal pains and swellings come on on some of the bones, and subsequently the menses become profuse and recur frequently. On becoming pregnant they will often abort. In what manner the syphilitic contagion, in such cases, has gained an entrance into the system, is not yet clearly known. We know just as little in what manner a woman who suffers from latent syphilis is capable of communicating the disease to her husband. Possibly, in such cases, the blood has served to transmit the infection, some bleeding erosions or excoriations having occurred on the genital organs.

In those cases in which the action of the luetic virus manifests itself in the form of an ulcer, the tissues at the base of the ulcer begin, at the end of the third or fourth week, to condense more or less markedly, or, if it is already cicatrized, the cicatrix becomes hard. If the action of the virus began in the form of a nodule, molecular disorganization will ensue a few days after it appeared. The disorganization is confined either to the upper layers, the epidermal or epithelial covering only being destroyed, and the infecting focus simulates an erosion, or the disorganization extends deeply into the nodule, and sometimes occasions a marked loss of substance. The solidification of the tissues at the base of the ulcer and the growth of the nodule are identical processes, and both of them give rise to that gradual hardness and increasing induration of

the tissues which are designated by the term *initial sclerosis* of syphilis.

The sclerosis does not originate at once, but gradually, and develops with well-marked remissions. For a time it is at a stand-still in its development, and then it suddenly takes a forward step. It may attain the size of a lentil, pea, or bean; it may also extend over a large area of tissue. The lips, the labia majora or minora, or the skin over half of the glans or body of the penis, may become indurated. Absorption begins in the center of the induration, as is shown by the diminished hardness of the tissues at this spot. After the hardness has entirely disappeared, a bluish-red discoloration, corresponding in size to the induration, remains behind. The discolored spot gradually grows pale, finally becoming whiter even than the normal skin (*pigment atrophy*). If the induration disappears by absorption, a central depression only will form; but if the induration undergoes disorganization a depressed cicatrix will remain.

Anatomy of the Syphilitic Initial Sclerosis.

The macroscopic picture of a syphilitic initial sclerosis varies according as it has developed upon an ulcerated or eroded spot on the skin, or is undergoing development or resolution. If a cutaneous ulcer acquires a sclerotic condition through the reception of syphilitic virus, the solidification of the tissues will, at first, be limited to the margins and base of the ulcer; gradually, however, the parts beyond also become affected. If no noteworthy loss of substance, either through injury or ulceration, took place at the point of infection before infection occurred, an infiltrated node will form, which gradually increases both in circumference and in depth, grows harder and denser, and finally forms a firm tubercle with well-defined outlines, which sometimes feels like a solid encapsulated piece of cartilage. The upper surface of the infiltrated spot may in a few days undergo ulceration, in consequence of granular degeneration. An ulcer, varying in form and extent, may thus be produced; it presents a flesh-colored, finely granular, readily bleeding, velvety appearance, secreting a thin, sometimes gummy discharge, in which are found a very few pus-cells. Here, too,

the space beyond the line of demarkation surrounding the ulcer very slowly undergoes sclerosis.

In consequence of the pressure which the sclerotic node exercises upon the capillary vessels of the affected tissues the supply of blood to the parts is diminished to such a degree that, when the node is incised, a sound is heard like that produced by cutting cartilage, and very little blood flows. This pressure upon the capillary vessels may also be the reason why the sclerotic tissue is not removed by softening and suppuration, but is destroyed by the slower process of fatty degeneration and absorption, or by necrosis, layer by layer from without inward. External and local influences, such as friction, cauterization, etc., may bring about a more rapid degree of necrotic disorganization of the sclerotic tissues. Softening and purulent infiltration then become superadded, and extensive destruction will ensue. In addition, a large or small part of the necrotic tissue may be destroyed by gangrene, and the node may then become so excavated as to leave only a hard shell behind. After the slough has been cast off and a permanent cicatrix formed, this will give it the characteristic hardness. This process differs from the sloughing that takes place in a soft chancre by the fact that the latter destroys normal tissues, while in syphilitic initial ulcers morbid products that have been deposited are destroyed.

Sclerotic places that have undergone necrosis cicatrize very slowly, and even when they have fairly cicatrized they do not always remain so, since syphilitic sclerotic cicatrices often break open again. This may happen so long as the sclerotic tissues are not entirely absorbed and replaced by perfectly normal material. After the sclerosis has disappeared, an excavation results, in consequence of atrophy that has begun in the center, and this has a semiotic significance.

Under the microscope, the initial sclerosis of syphilis presents very dense cellular infiltration which is not particularly characteristic. The cellular infiltration affects the papilla of the skin and the subcutaneous connective tissue, and is especially abundant in the adjacent tissue of the blood-vessels, the adventitia of the latter being frequently involved in the infiltration. In most instances the lumen of the vessels is only

diminished in size; still, they may also be entirely occluded. We agree with Ziegler that the induration of the primary lesion of syphilis is produced by the long persistence of the fibers of the connective tissue, notwithstanding the profuseness of the infiltration. The majority of the cells are small; sometimes they are large, epithelioid; some of them have numerous granules. If the primary luetic lesion undergoes resolution without disorganization, a markedly discolored spot remains in its place, which subsequently becomes perfectly normal. If the node undergoes suppuration, a scar will remain.

Site and Form of the Hunterian Induration.

There is no place on the common integument on a person unaffected with syphilis at which a Hunterian chancre can not originate. No place possesses any immunity, neither does any possess a special qualification for producing it. It occurs most frequently on the genital organs of both sexes. In the male, on the internal surface of the prepuce, on the glans in the fossa coronaria, on the frænum, and on the penis generally; in the female, mostly on the edges of the labia, at the anterior and posterior commissure, and on the præputium clitoridis. On the mucous membranes, the sclerosis is less distinctly marked in general, and sometimes is totally overlooked. Hence it happens that, on the parts of the female genital organs, where infection naturally occurs most frequently—for instance, in the vestibule and introitus vaginæ—a sclerotic node is very seldom detected on the mucous membrane. On the other hand, it develops more distinctly on the os uteri, where, however, it can only be definitely diagnosed by the aid of a uterine speculum, into which the indurated os uteri does not glide like a normal os, but shoots in in consequence of the elasticity it has acquired through the Hunterian induration. If the speculum be pressed against the indurated os, or if pressure is made upon the latter with a wooden rod through the instrument, the fibro-plastic material deposited in the part will appear like a mass of transparent mother-of-pearl.

Hunterian indurated chancres may be produced on the conjunctiva of the eye, on the mucous membrane of the nares, on the cheeks and chin, by transportation with the fingers and

under the nails, and by kissing. Sclerotic chancres on the lips and tongue of both sexes occur by kissing, sexual depravity (*cunnilingus*), by transmission by the agency of utensils, pipes, etc. Indurated chancres on the lips generally extend only as far as the vermilion border, and seldom reach beyond it to the mucous membrane. The Hunterian initial sclerosis is frequently seen upon the nipples of the breast, where it originates in wet-nursing syphilitic children. It often occurs on the fingers. Only one syphilitic initial sclerosis, as a rule, is met with on a person; but, if several places become infected at the same time, all the parts are apt to become indurated.

The *form* of the induration depends upon the character of the infected portion of the skin, and also upon the depth to which the syphilitic virus has penetrated. The deeper the virus penetrates into the tissues, the more pronounced will the induration be; the more spongy the tissues of the infected place, the more diffused will it be. If the syphilitic poison has penetrated below the integument, round or semicircular nodules, as hard as fibroids, will originate. If, during infection, the lesion affected only the epidermis layer, and the solution of continuity is an extensive erosion or excoriation, the induration of the tissues will be like a thin plate, having the hardness of chondroid tissue, and the fingers experience a sensation on pinching up a fold of the skin as if a bit of parchment is imbedded in the sore (*chancre parcheminée* of Ricord). This last form occurs almost exclusively on the mucous membrane of the prepuce, where in retracting it the chancre becomes everted in the same manner as one everts the tarsal cartilage of the eyelid. In addition, it possesses the peculiarity of cicatrizing with surprising quickness. Frequently the phimotic prepuce becomes converted into a hard, dense, cartilaginous funnel. In congenital constriction of the prepuce, the lips of the foreskin are often lacerated during intercourse in several places, into which the syphilitic virus is apt to be deposited, and all the lacerations afterward become indurated. The orifice of the prepuce then becomes converted into a dense ring, producing almost total phimosis, that is not relieved until resolution of the indurated deposit has taken place. If the poison of syphilis adheres to one of the sebaceous follicles—a condi-

tion that generally happens when a follicle is deprived of its epithelium by seborrhœal disease—the induration that then takes place in the follicle will assume the form of a cylinder standing on end. But if a number of contiguous sebaceous glands become infected, as is often the case in those situated in the fossa coronaria of the glans penis, a hard wall originates from the coalescence of these indurated glands and encircles the glans like a wreath. If both lips of the meatus in the male are the site of the syphilitic infection, the orifice becomes transformed into a dense, patulous, funnel-shaped opening, which feels like cartilage.

Combined Effect of the Syphilitic Virus and of the Chancroid Virus.

In the same way that an individual may be infected at the same time or in succession on two different parts of the body —on the genitals with a soft chancre, on the lips with a constitutional ulcer or syphilitic chancre—so both poisons, that of the soft chancre and of constitutional syphilis, may be deposited on the same part of his person simultaneously, or one after another. In such a case, both contagions may develop their local effects together. The chancroid develops and the induration follows; indeed, if both poisons are deposited at the same time and place, the soft chancre will have been far advanced before the induration manifests itself. Generally, this does not occur till the eighteenth or twentieth day from the time the chancroid appeared. If the syphilitic virus has been absorbed several days before the poison of the soft chancre was deposited on the same spot, the induration will appear a few days after the chancroid. If a soft chancre is inoculated upon a syphilitic indurated base, it will display all the modifications it usually shows on the normal skin and mucous membranes. A superficial and deep phagedenic, or other variety of chancroid, may originate upon a syphilitic, indurated chancre. In the latter case, the phagedæna will destroy the induration, and the chancrous ulcer will be surrounded like a hard shell by the excavated indurated tissue. But if the induration was in process of development when the infection with the chancroid took place, the tissues adjacent to the phagedenic chancre will be

destroyed by the phagedæna, and the induration will spread peripherally in the contiguous tissues that are unaffected by the soft chancre. In both cases the cicatrization of the chancroid progresses very slowly. This, we think, is due to the fact that no retraction of the skin can take place here, because the chancroid is surrounded by indurated tegumentary tissue. Cicatrization is effected by a process of new growth, connective tissue fibrillæ effecting, in this way, the closing up of the ulcer, while the rest of the original induration now surrounds the cicatrix like a wall in the form of a hard ring that frequently desquamates (circular induration). Under general antisyphilitic treatment the fibro-plastic exudation will be absorbed, rendering it possible for the retraction of the skin to take place, and expediting cicatrization.

Inoculability of the Sclerotic Ulcer.

As has been repeatedly stated, inoculations with the discharges from syphilitic infecting foci, especially suppurating initial indurations and syphilitic papules, will produce pustules and ulcers in those affected with these lesions, and in other syphilitic persons. Hence, the auto-inoculability of an ulcer upon a person affected with it is of no great value as a diagnostic aid for the purpose of deciding whether an ulcer is a syphilitic initial sore or a simple venereal sore (chancroid). This is all the more true, since even pus of non-venereal origin will produce on syphilitic persons a series of inoculable ulcers.

Therapeutically, however, the auto-inoculation of syphilitic infecting foci must be taken into consideration for the purpose of carefully isolating suppurating sclerotic indurations and syphilitic papules, lest they produce ulceration by impression upon adjacent normal tissues.

Significance, Duration, Course, and Differential Diagnosis of the Syphilitic Initial Sclerosis [Hard Chancre].

A fully developed syphilitic initial sclerosis is of the utmost importance from a diagnostic and prognostic point of view, because from the moment it originates the effects of the commencing syphilis may be recognized. The patient is under the influence of the syphilitic diathesis so long as the in-

duration lasts, and it only becomes less significant when it has entirely disappeared along with the constitutional phenomena.

Left to itself, a primary induration that is situated upon the common integument will undergo desquamation attended by repeated congestions of the part. The epidermal covering of the induration, which is frequently renewed, has a peculiar glossy appearance and dark-brown color merging into redness. The upper surface of the nodule often degenerates after repeated desquamation—a condition which, if preceded by sexual intercourse, will lead the patient to believe that he has been infected anew. The consecutive ulceration may begin in the center as well as at the upper surface of the nodule, or eccentrically, and may remain superficial or attack the deeper layers. It may originate at several points simultaneously and progress rapidly, and thus resemble phagedæna—a phagedæna that consumes the entire nodule without attacking the parts around it. This kind of phagedæna vanishes all the more quickly when the ulcer is not interfered with by caustics or irritating remedies.

Sometimes, though rarely, the primary sclerosis undergoes a peculiar softening. The center of the nodule liquefies, forming a yellowish, purulent, or ichorous fluid, which, as in an abscess, gradually escapes outwardly through several small openings. The remaining walls of the abscesses that form in the primary induration disappear by absorption. A second sclerotic nodule occasionally originates in the immediate vicinity of the first one, although recurrence of the infection has not taken place.

The size and extent of the induration possess no prognostic significance respecting the benign or malignant character of the syphilis. Small and recent indurations usually are more amenable to treatment than those which are large and old.

On the appearance of the eruptive fever and of the cutaneous syphilide the induration generally becomes small, and soon disappears entirely, leaving behind a copper-colored spot, which, as a prognostic sign, is of no less importance than the induration itself. So long as this discolored spot is not entirely absorbed, the syphilitic diathesis is not cured, even though all the other symptoms of the skin and mucous mem-

brane produced by the syphilis have vanished, or perhaps have not yet appeared at all, because the induration has been treated with mercury from its very inception.

According to our experience, it sometimes happens that an induration that has well-nigh disappeared, grows again after a longer or shorter period, and attains its former proportions (*chancre redux*), a condition that has been described as repullulation of the sclerotic node. This is, in so far, of prognostic importance, as it proves the obstinacy of the disease, and may be considered a prodrome of the speedy eruption of a syphilide.

We have seen indurations last three months, even when the patient was treated with mercury from their very inception. Very often they last eight or nine months, and even longer.

With regard to the differential diagnosis, syphilitic initial sclerosis may easily be mistaken for *epithelioma*. The microscopic examination, to be sure, will furnish satisfactory evidence of the nature of the morbid alteration; but the experienced clinical physician will also be able to exclude syphilitic induration from the continuous disintegration of the carcinomatous infiltration, and from the absence of the solitary, degenerating, peculiar, rosy-red, velvety sclerotic ulcer. The differential data between soft chancre and a Hunterian indurated chancre have already been described.

We have repeatedly seen in children, who had been circumcised according to the orthodox Hebrew rite, a distinct indurated node undergoing disintegration, situated in that part of the foreskin which remained, and in the glans penis, with coexisting hyperplastic enlarged lymphatic inguinal glands, that sometimes suppurated. Yet the children never suffered from secondary syphilis, having been kept under observation long enough to settle that point. Hence it seems that this kind of induration must be ascribed to the unskillful manner in which the operation, especially the laceration of the mucous membrane of the prepuce, was performed.

Unicity of the Syphilitic Infection.

Since other specific diseases, such as scarlatina, measles, etc., seldom occurred more than once in the same person, it was

supposed that this might also be true of syphilis. And, in fact, instances of persons having syphilis twice are very rare exceptions. Experiments undertaken for the purpose of confirming this belief have proved that inoculations of persons with syphilitic virus who are still under the influence of the syphilitic diathesis produce no indurated chancres. From the results of these experiments Ricord was able to formulate the dogma of the unicity of syphilis (*uncité de la syphilis*)—i. e., any one who had or has syphilis, or, what amounts to the same thing, has had a Hunterian indurated chancre, never can get it again; more correctly speaking, never can be infected again by syphilis. Ricord explained this law, which he announced, by the assertion that the syphilitic poisoning, when once produced, lasts forever, and our treatment is only able to cause the manifestations of the disease, but not the disease itself, to disappear.

This dogma of the unicity of syphilis is not, however, so invariably true as Ricord claims. H. Zeissl and other physicians have had repeated opportunities of observing reinfection in one and the same person. The reinfection with syphilis of a person who has had the disease proves that he was totally cured of his first attack. According to Diday, three important corollaries may be deduced from this law, namely:

(*a.*) Syphilis can be cured radically.

(*b.*) The length of time necessary for a radical cure of syphilis is at least twenty-two months.

(*c.*) The best proof that syphilis can be cured radically is the possibility of reinfection.

The treatment of syphilitic reinfection is the same as that of primary infection.

Affections of the Lymphatic System occasioned by Beginning Syphilis.

On examining the parts of the body in the vicinity of a Hunterian indurated chancre, there will generally be found one or more lymphatic glands which are swollen and dense, and have the same hardness as the chancre. This glandular swelling is, it is true, rather painful during the early days of its existence, but, after a while, it usually becomes less sensitive

when touched. On account of this painless condition, it is described as an *indolent* swelling of the lymphatic glands, or bubo. The enlargement of the affected glands takes place without any marked reaction, or the least febrile movement. At first the implicated glands are but slightly swollen, and quite movable; but the more they swell, the more they become adherent to the subjacent tissues. As a rule, the skin over them remains unaltered, and for a long while afterward may be pinched up in folds. Several adjacent glands are usually swollen; still, they remain isolated from each other, and only exceptionally do they coalesce into one common tumor.

These indolent buboes usually do not form until the initial lesion of syphilis is already in a state of disintegration. Finally, if we take into consideration the fact that indolent buboes are almost always found on the parts of the body nearest the site of the infection, we are justified in maintaining that, from a genetic point of view, they are buboes of absorption, and not of constitutional origin. Auspitz asserts that the propagation of the contagium of syphilis to the blood, from its point of entrance into the system, does not take place through the lymphatic vessels, and thus cause all the lymphatic glands of the body gradually to swell up as the poison progresses, but that the indolent inguinal buboes only indicate the local absorption by the glands lying adjacent to the primary lesion, while the direct absorption of the poison from its place of entrance most probably is brought about through the blood-vessels. The general swelling of the glands which occurs in syphilis is simply an evidence of the blood-poisoning that is already present.

The pathological alterations of the glands under consideration are the result of hyperplastic enlargement of all those elements which constitute the affected glands, not excepting even the glandular capsule, which is more or less thickened. In the further course of the disease the glands undergo fatty or amyloid degeneration.

The indolent glandular swellings sometimes are round and then again oval, and, as a rule, become as large as a hazel-nut or walnut. In scrofulous, tuberculous, and weakly persons, they quickly attain, as a general thing, an enormous size, attended

by more or less marked inflammatory phenomena, and occasionally constitute, when they are close to each other, tumors as big as a man's fist. These enormous glandular swellings have long been designated as *strumous* buboes, because the word "strumous" signifies the same as scrofula. Strumous buboes usually present an uneven, lobulated appearance, and are constricted in various places.

As has been mentioned above, the glands adjacent to the place of infection are always affected first, in consequence of the absorption of the syphilitic virus; still, the cubital gland, in exceptional instances, in chancres on the fingers, is overleaped, and the axillary or jugular glands on the corresponding side become involved. As most of the syphilitic infections take place on the genital organs, we consequently find that the glandular disease that invariably follows occurs in the inguinal and femoral region. As a rule, only the superficial inguinal and femoral glands swell up, the deeper ones becoming involved when constitutional complications are present, such as scrofula, tuberculosis, or rachitis, or through local purulent imbibition. Several inguinal or femoral lymphatic glands are generally affected.

Indolent glandular indurations, in consequence of syphilitic infection on the genital organs, mostly occur on the side of the body that the Hunterian chancre is situated on; exceptionally, however, the glandular induration is met with on the opposite side, and in primary lesions situated on the median line of the genital organs, such as the frænum or posterior commissure of the vulva, the glands in both groins will become indurated.

Indolent buboes often remain stationary for three or four months, notwithstanding the anti-syphilitic treatment employed; after many years they diminish, and disappear by absorption. Sometimes they undergo calcareous degeneration. Resolution takes place by the process of fatty degeneration.

Syphilitic buboes seldom undergo suppuration; and, when they do, it is in consequence of constitutional or local complications. Scrofula and tuberculosis are the chief causes that bring about softening or caseous degeneration of the indolent, hypertrophied lymphatic glands. Strumous buboes, however,

differ vastly in their course from the small ordinary indolent buboes. The movable skin, covering strumous lymphatic glands, soon becomes adherent to the swelling beneath it, gradually turns red, and even slight pressure causes pain. But notwithstanding the palpable inflammatory phenomena, it requires an extremely long while for deep softening to ensue. The same is true of resolution, which the best directed measures are slow to bring about. Finally, a few solitary spots in the swelling, as big as a hazel-nut or walnut, become spongy and fluctuate. Nevertheless, when an incision is made, only a small quantity of glutinous fluid and considerable bloody serum escape. A premature incision into one of these buboes will produce a rapid, but only partial, disorganization of the swellings. However, only the subcutaneous and the glandular intermediary cellular tissue is destroyed, while the hyperplastic enlarged glands themselves remain intact. Hence, one or more tortuous fistulæ form in the entire region of the glandular swelling, beneath the skin or between the lobes of the glands. If the undermined skin is divided with a knife, a layer of new connective tissue often forms on the lips of the wound, between which the new tissue frequently extends, at a later period, like bridges and arches. The adventitious tissue usually is destroyed, and involves in molecular disintegration the subjacent cellular tissue that exists between the swollen glands, thereby vastly enlarging the ulcer. It acquires a yellowish, lardaceous coating, and at the bottom the glands, hypertrophied and increased to the size of walnuts, and partially deprived of their capsules, are seen as if dissected out with a knife. As a result of the burrowing, and also of the imbibition of the pus, the diseased lymphatic glands and other portions of connective tissue become involved in the morbid process in different directions; new straight or tortuous inflammatory foci start up on the prolongations of the adventitious connective tissue, which likewise soon deliquesce through molecular disorganization, causing new fistulous passages. Along the course of the fistula the connective tissue becomes indurated, and the tract becomes lined with a pyogenic membrane, which, however, does not secrete pus, the discharge being at the most a fluid that contains molecular disorganized matter. The pus and the ichor

may burrow in these fistulous passages; and, in case a timely exit is not provided, new inflammatory foci will start.

Under the local complications which softening of indolent buboes may occasion, even in persons with good constitutions, we understand suppurating foci situated on places which, by means of the lymphatic vessels, are intimately connected with the indolent glandular swellings. To this category belong moist, ulcerating papules, syphilitic and non-syphilitic pustular eruptions, specific and non-specific ulcers, syphilitic and non-syphilitic panaritiæ [paronychiæ], but, above all, chancrous ulcers, and sometimes blennorrhagia of the genital organs. Now, if the pus originating from one of these suppurating processes finds its way, through the action of the lymphatic vessels, into the indolent swollen gland, all the inflammatory phenomena that occur in an acute bubo of absorption manifest themselves in the swelling that hitherto had remained dormant.

Inoculations made with the purulent contents of indolent buboes on persons affected with them, as also on syphilitic patients generally, are of importance only in so far as they show that, even in those cases in which softening was not caused by complicating chancroid ulcers, any kind of pus, as we have already shown, when inoculated, will produce positive results.

The *prognosis* of indurated buboes which accompany Hunterian chancres must be considered from a double standpoint: first, as regards their significance for the general system; and, secondly, as regards the local morbid alterations that are liable to occur in the affected glands and their immediate surroundings.

The Hunterian primary lesion does not acquire its full pathognomonic and prognostic value till the indurated glands appear; i. e., we are not justified in considering a circumscribed induration of the tissues as a result of syphilitic infection and in prognosticating the speedy appearance in the affected person of other syphilitic lesions in other tissues of the body, till the swelling of the glands has ensued.

Now, as regards the local significance, most of the indurated buboes in persons with good constitutions, under an appropriate treatment, are made to disappear in the course of four or five months, either by absorption or calcification. It

is totally different in the case of indolent strumous buboes. They are the unfortunate products of a complication that is of the utmost importance for the future of the patient—namely, of syphilis with scrofula or tuberculosis—two diatheses that are liable to be kindled, and which, if developed by syphilis, exercise a most pernicious influence over the development and resolution of the syphilitic morbid lesions. The tedious character of scrofula and of tuberculosis is soon manifest from the tedious course of the strumous bubo. Strumous buboes usually outlast all the other early phenomena of syphilis. Under favorable contingencies they require five or six months for resolution, which, however, only partially takes place; a large portion of the affected glands undergoes calcification. Still, even fluctuating strumous buboes may undergo resolution, provided suppuration was not occasioned by the absorption of chancroid virus. These kinds of buboes often burst; a small quantity of pus mixed with bloody serum escapes, and the remainder of the tumor soon becomes smaller. The future destiny of strumous buboes, when they are prematurely opened, assumes a far more unfavorable course. In this case, deep, penetrating destruction of the tissues may follow. In inguinal and femoral glandular buboes fistulæ may originate, which may extend from Poupart's ligament downward to the apex of the trigonum inguinale and upward as far as the navel. The pus may escape into the inguinal canal, and thence into the abdomen, or, following the spermatic cord downward, accumulate in the scrotum; or, after penetrating the femoral fascia and the sheath of the femoral vessels, reach the knee-joint. Marasmus, tabes, fatal peritonitis, and pyæmia are frequent results of this condition. It is even possible for gangrene to supervene, and deep arteries, that are difficult to ligate, like the epigastric or iliac, become eroded, causing hæmorrhage that terminates in death. The cicatrization of strumous, inguinal buboes, too, may afflict the patient with the most serious permanent annoyance, by the formation of a cord-like cicatrix that extends from the groin down along the anterior surface of the thigh, or upward upon the abdomen. These cicatrices, in time, may contract to such a degree as to prevent the patient from standing upright.

Induration and Hypertrophy of the Peripheral Lymphatic Vessels in consequence of Syphilitic Infection.

In some cases it is possible to demonstrate the manner in which the primary affection of the lymphatic glands by the syphilitic virus was brought about, by a pathological alteration of those lymphatic vessels which run from the Hunterian chancre to the indolent glands. Without any phlegmonous phenomena, and in the most passive manner, an inflammatory process develops in the affected lymphatic vessels, in consequence of which they become like cords, hard and movable under the skin, painless, and of the thickness of a raven's quill or goose-quill. The hypertrophy of the cord-like lymphatic vessel is not always uniform throughout its entire extent; many nodular swellings of the size of a millet-seed up to that of a hazel-nut form at various places in the course of the lymph-current. The skin covering the lymphatic cord is usually unaltered; but after the nodular swellings have lasted for many weeks a slight furfuraceous desquamation and redness of the skin over them are observed. On the appearance of these phenomena, a syphilitic eruption generally supervenes.

The indolent induration of the lymphatic vessels originates at the same time with the induration of the lymphatic glands that ultimately become indolent, and it has the same pathognomonic significance. The same morbid alteration which takes place in the cells of the gland occurs in the lumen of the affected lymphatic vessel. In most cases, however, the swelling of the glands, in coexisting induration of the lymphatic vessel, is not very pronounced. The infarction of the lymphatic vessel always disappears by resolution. If many nodules exist, those situated at a distance from the place of infection, and of the most recent formation, disappear first. We have rarely seen suppuration and breaking down of this kind of lymphatic vessels.

The affection of the lymphatic vessels, just described, occurs with the greatest frequency on the dorsum of the penis; sometimes, however, on the lateral surfaces of this organ, as also on the prepuce and near the frænum; but at the latter place the cords are much shorter. We have never observed

this morbid lesion on other parts of the body; in females, it occurs in exceptional instances only.

The Syphilitic Diathesis.

Although one is justified in assuming that after the Hunterian induration has taken place, and the indolent buboes have appeared, the general toxæmia is established, since no induration can be produced anew on the persons afflicted with the local lesions mentioned by inoculating them with syphilitic virus; nevertheless, patients suffering from the early phenomena of syphilis are apparently in good health for a time, and we are totally unable to discover the least sign of the consecutive phenomena of the disease that are destined to develop in the various tissues of the body. This period of quiescence in the development of the constitutional phenomena is described as the *second period of incubation.* In order to explain this interval that takes place between the occurrence of the induration and of the indolent swelling of the glands, on the one hand, and the outbreak of the remainder of the constitutional phenomena, on the other hand, it is assumed that the syphilitic virus is dormant for a while in the system, and then becomes active again. This hypothesis is supported in a measure by the fact that frequently, even in the latter periods of constitutional syphilis, a temporary period of apparent extinction of the disease occurs (*latency of syphilis*).

It is our opinion that in syphilis the disease of the lymphatic system, at any rate, is of prime importance, and that the syphilitic virus is conveyed to the blood by the lymphatic vessels; and that by the constant mutual interchange that takes place between the blood and the lymph the syphilitic virus permanently changes specifically the entire quantity of the blood. Our senses, however, are not capable of perceiving the morbid alteration of the blood produced by the syphilitic virus. With the same degree of justice that we assume the diseased condition of the lymph from the morbid alterations of the lymphatic vessels and glands without being able to prove the morbid alterations of the lymph, so do we feel justified in assuming the diseased condition of the blood from the morbid state of the rest of the tissues of the body. And just as the

lymph must be diseased before the affection of the lymphatic vessels and glands appears, so must the blood be morbidly changed before any sign perceptible to our senses will indicate its diseased condition in the various tissues of the body.

These pathological disturbances of the composition of the blood that are undemonstrable, being only inferable from the results, have been designated by the name of syphilitic diathesis—a condition that is intended to fill up the gap between the infection that had taken place and the pronounced syphilitic dyscrasia.

Pathological Alterations of the Blood of Syphilitic Persons.

After the Hunterian indurated lesion has lasted for eight or ten weeks, those phenomena gradually appear which incontestably prove that certain morbid alterations of the blood have taken place. The skin of the patient loses its fresh, healthy, rosy color, and gradually acquires a waxy, sallow, chlorotic hue. At the same time a general emaciation ensues in many cases. So far, neither chemistry nor the microscope has succeeded in finding any pathognomonic products in the blood of syphilitic patients.

We believe that although the syphilitic blood-disease begins with the absorption of the syphilitic virus, still it is just as little possible in the early days of the disease to prove the alteration of the blood as in most other infectious diseases. The macroscopical alterations on the syphilitic patient compel us to assume that the nutritive element, at least the albumen of the blood, has suffered some kind of change. The altered blood, on the one hand, then exercises an extraordinary amount of irritation upon the lymphatic glands, whereby they become hypertrophied; on the other hand, by the disease of the lymphatic glands, a retroactive effect upon the blood must also take place, either because the abnormal increase of cell-life of the glands causes larger numbers of white blood-corpuscles to enter the blood, or because after ischæmia of the lymphatic glands has ensued, the formation of blood-corpuscles is entirely arrested. But neither leucæmia nor oligæmia and chloræmia are the causes of the original blood-disease—they are simply its effects.

[Quite recently Lustgarten and Doutrelepont have found, in the morbid product of the syphilitic diseases and in the discharges, bacilli which in form resemble tubercle bacilli, but are distinguished from them by the staining. The bacilli are mostly inclosed in cells, from two to eight in one cell; very few of the latter are found in the center of a syphilitic exudation, but in larger numbers at its borders, and in the adjacent apparently still normal tissues.

The bacilli are always found in the initial syphilitic lesion, in the papules, in the gumma nodes, and in the discharge from a syphilitic chancre and from the papules. This fact, taken in connection with the negative results obtained by similar researches, made into the most varying morbid products, renders it highly *probable that these bacilli actually constitute the syphilitic poison.* This probability becomes still greater since we have learned that bacilli are likewise the contagium of infectious diseases that are analogous to syphilis—lepra, tuberculosis, etc.—though this will not be irrefutably established till we are able to generate the bacilli outside of the human body, and to produce syphilis by inoculations with a bacilli product obtained by cultivation.]

Eruptive Fever of Syphilis.

The first eruption of general syphilis is usually preceded by febrile movement, which is not unlike that occurring in catarrhal or rheumatic affections. The patients are hot, restless, and sleepless, and feel uncomfortable, tired, and suffer from loss of appetite. In some cases, a ravenous appetite comes on. The expression of the face becomes dull, the skin pale, the eyes sunken and tired. At the same time the individuals are tortured by vague rheumatic, intermitting pains, which now afflict the head, next the shoulders, and then again some of the joints and limbs of the body, or localized neuralgias, for instance, of the infra-orbital nerve, are present. In many patients a blowing heart-murmur is audible. The pulse often reaches one hundred and ten per minute, and some increase of temperature is also noticeable. The patients suffer from night-sweats, and their urine deposits a heavy sediment of uric-acid salts and urerythrin.

The eruptive fever subsides on the outbreak of the morbid phenomena in the various organs and on different parts of the body, but sometimes it returns again in the course of the affection, when sequelæ or relapses ensue. The eruptive fever usually attains its acme in twenty-four or forty-eight hours; then it generally remits, as in acute exanthemata. In regard to the influence of the remedies that have been resorted to in a given case, upon the increase of the temperature, it may be said the inunction of blue ointment usually causes a slight increase of the temperature, but later on in the disease it is often followed by abnormal diminution of the temperature. The treatment with the preparations of iodine at first does not seem to have any marked effect upon the temperature; later on, it causes an increase, but soon after using them the temperature returns to the normal.

Time of Eruption of General Syphilis.

According to our experience, the eruption of secondary phenomena never takes place before the eighth week after infection. Remedial measures may postpone the outbreak of syphilis, but they can not prevent it; we possess no remedy with which we can eradicate the disease, and, still less, annihilate it, in the first few weeks of its existence. On the other hand, injurious influences, such as violent mental excitement, excesses in *Baccho et Venere*, forced marches, traveling at night, etc., may hasten the outbreak of the secondary phenomena.

Localization of the Syphilitic Foci.

All the tissues of the human body may become diseased by syphilis; still, the morbid process seems to have a preference to become localized upon the common integument. Next in frequency, certain parts of the mucous membrane—for instance, the nares, fauces, mouth, larynx, œsophagus, rectum, vagina, uterus, urethra, etc.; next the periosteum, the endosteum, and the bones themselves (especially some flat and a few long tubular bones), the perichondrium, and the cartilage of certain organs, the septum nares, and larynx, for instance, and certain serous membranes, the perimysium and the iris—are attacked.

Of the fibrous membranes, the albuginea testis and the sclerotic coat of the eye are the only ones that are affected. The submucous and subcutaneous tissues are often attacked; the liver, spleen, heart, kidneys, lungs, brains, and certain nerves, the blood-vessels and bowels, are less frequently diseased.

The Cachexia produced by Syphilis.

If syphilis has once engendered certain morbid alterations in some of the organs that play an important part in the economy, the constitution of the patient is sure to suffer from a cachexia that will completely exhaust him, and the disease will terminate in death. This is especially the case when, in consequence of amyloid degeneration of the kidneys, albuminuria or hæmaturia is produced. Certain conditions of the individual—bad living, complications with other diseases, such as tuberculosis, gout, scurvy, improper treatment, etc.—are likely to hasten such an unfortunate termination.

Combinations of Syphilis.

Acute diseases exercise a remarkable degree of influence over syphilis, especially over the early phases of the disease. The muco-papular syphilide of the skin, and of the mucous membrane, quickly disappears on the occurrence of an acute affection, but returns as soon as the latter subsides. On the other hand, the dry and ulcerative forms of skin lesions, mucous patches, *plaques muqueuses*, syphilitic diseases of the bones, are but little affected by acute maladies.

Chronic diseases may not only coexist with syphilis, but will accelerate its course. This is especially the case with the consumptive affections, such as tuberculosis, scurvy, etc. A combination of gout and syphilis renders both morbid processes obstinate to treatment. Syphilis exercises a most injurious effect over pregnancy, frequently resulting in abortions and miscarriages. On the other hand, pregnancy retards the retrograde development of syphilis, the anti-syphilitic remedies being hindered in their action by the process of gestation.

In regard to the influence of syphilis upon the course of a wound, clean cuts heal in syphilitic persons as rapidly as

in the non-syphilitic. But if a fresh syphilitic scar is cut into, it will occasionally be transformed into an ulcer. The union of fractures is sometimes retarded by the syphilitic diathesis in syphilitic persons. Mechanical or chemical irritations are liable to produce, on the irritated places, inflammatory products analogous to the phase of luetic lesions from which the patients happen to be suffering at the time. Cauterizations performed on persons afflicted with a recent or latent form of the disease do not furnish such results as would justify one in inferring from their appearance the character of the syphilis present (*cauterisatio provocatoria* of Tarnowsky).

Succession and Phases of Syphilitic Affections.

Not only the manner of succession in which syphilis attacks the different tissues, but the local morbid phenomena and their metamorphoses display a certain degree of regularity. First of all, the lymphatic glandular system, the common integument, with its appendages, and the mucous membrane, become diseased. The affection of the periosteum, of the bones, of the subcutaneous and submucous connective tissue, follows later. The affections of the viscera belong to this category. In consideration of this well-nigh constant succession of attacks, Ricord divided them into three groups, and designated them as *primary*, *secondary*, and *tertiary syphilis*. In the primary stage he placed the Hunterian sclerosis and glandular indolent swelling; in the secondary, the disease of the upper layer of the general skin and the mucous membranes; in the tertiary, the affection of the subcutaneous and submucous connective tissues, the bones, the serous and fibrous membranes, and the parenchymatous organs.

But no such distinct division as was made by Ricord really exists. Thus, there are often seen syphilitic affections of the bones in the early period of the disease, and, conversely, ozæna syphilitica frequently occurs in connection with those eruptions of the skin which Ricord places among the secondary phenomena. It seems to us that the classification adopted by H. Zeissl, namely, the stage of *moist papules*, or *condylomata*, and the stage of *gummatous adventitious growths*, is much more correct, because the appearance of the first gummatous

node upon the skin, or in any of the visceral organs, almost excludes the presence of moist papules. The morbid processes of the condylomatous stage may be regarded as lesions of irritation, those of the gummatous stage as new growths. The first group embraces the affections of the lymphatic system, of the skin and its appendages, of some parts of the mucous membranes, and of the iris. The second group includes the diseases of the subcutaneous and submucous cellular tissues, of the fibrous membranes, of the bones and cartilage, of the muscles and viscera.

Development, Course, and Duration of Constitutional Syphilis, and its Mortality.

The development and dissemination of syphilis do not go on steadily and uninterruptedly; apparent recoveries (stages of latency) occur periodically, and are followed by new eruptions, which may be more severe even than the preceding ones. The intervals of apparent recovery may last many months, even many years. On carefully examining such a patient, traces of latent syphilis, such as swelling of the lymphatic glands, opacity and hypertrophy of the epithelial cells of some parts of the mucous membrane, discolored cicatrices, hypertrophies or nodes on the bones, etc., will always be found. The slow or rapid succession, as also the speedy or tardy development and resolution of some of the morbid lesions, varies exceedingly, and depends chiefly upon the congenital or acquired individual peculiarities of the constitution, and upon the age of the patient; sometimes, however, also upon various accidental causes and influences. In syphilis, the law of *partium minoris resistentiæ* is seen everywhere exemplified. The phenomena of the first stage, as a rule, display a certain degree of activity, while the symptoms of inveterate syphilis (gummatous phase) run a tedious course. In some cases the different phases of the disease follow each other rapidly and violently (*syphilis galopant*), while in others, months, and even years pass before a new eruption follows, or more serious effects of an almost forgotten disease appear. In the first phases of syphilis the dry eruptions of the skin usually disappear by resolution; in the later periods, however, ulcers form.

The duration, like the course of syphilis, varies exceedingly, according to the individual peculiarities, the age, and the conduct of the patient, and the various complications that may occur. If the natural course of the disease is not interfered with by therapeutical measures, a complete spontaneous cure may take place at the end of a certain length of time; but, conversely, in patients who undergo no treatment, the most serious forms of syphilis may develop. Treatment exercises a most important influence over the course and duration of the disease. Syphilitic patients who are mercurialized very early, especially before general phenomena have appeared, are oftener attacked by grave lesions of syphilis (cerebral and visceral), and they are oftener subject to relapses than those who, for a long time, were not treated at all, or first with iodine, and later on with mercury. A cure of the disease may indeed be brought about in any of its stages; the most rapid and permanent is achieved in those most recently attacked. In the most favorable cases, to be sure the rarest, a cure may be accomplished in from three to four months; in most instances, however, it takes two, three, or more years. Under unfavorable conditions and unsuitable treatment, the disease, now improving, and then again becoming aggravated, will drag along many years till finally some serious lesions of the tissues, or disturbance in the functions of important organs, ensue, resulting in paralysis and chronic invalidism that terminate in death.

Syphilis itself rarely causes death; and, when this happens, it is generally in consequence of gangrene, profuse hæmorrhage from arterial branches that are difficult to ligate, or necrosis of the bones of the skull. In some cases, suffocation, in consequence of hæmorrhage into Morgagni's cavity of the larynx, or œdema of the vocal cords (laryngostenosis syphilitica) puts a sudden end to the patient's existence; while in equally rare cases the patients succumb to albuminuria (Bright's disease), syphilitic affections of the liver, of the nervous centers, of the cardiac muscle, to marasmus, or, finally, to tuberculosis generated by syphilis, or an improperly managed mercurial treatment.

Development of Lymphatic Glandular Swellings originating in the course of Syphilis (Multiple Adenitis).

In about five or six weeks after the indolent buboes have formed in the immediate vicinity of the primary syphilitic induration, other chains of lymphatic glands enlarge in various regions of the body at a distance from the indolent buboes. We think we are justified in offering the following physiological explanation of the syphilitic swelling of the lymphatic glands, viz.: The syphilitic virus is absorbed by the lymphatic vessels, and the first pathological sign that absorption has taken place is the appearance of an indolent bubo. The syphilitic contagion is not retained in this primary swollen lymphatic gland, but is conveyed with the lymph to other tissues and glands.

The chains of lymphatic glands that swell up most markedly are those situated in the neck at the posterior border of the mastoid process and sterno-cleido-mastoid muscle, the jugular and subclavicular, the axillary, and the remainder of the inguinal glands which were not primarily affected, the cubital and the submaxillary glands. In the syphilitic cadaver, the lymphatic glands situated upon the inner surface of the sternum, the bronchial, the abdominal, and the pelvic glands, are also found greatly enlarged.

The enlarged syphilitic glands at first are only as large as a pea, bean, or hazel-nut, and, as a rule, swell up without any inflammation, and are not sensitive; but, like the primary indolent buboes, they may subsequently become greatly enlarged in consequence of scrofula or tuberculosis, and undergo suppuration, in part at least, if they absorb purulent material from any ulcerating sore in the vicinity.

Multiple adenitis is an almost constant attendant upon all the other syphilitic lesions, and generally keeps pace with them in their aggravation and improvement. In doubtful cases it is a most valuable sign regarding the nature and character of the morbid lesions situated in other tissues of the body; and even in those cases in which a partial cure has caused the other effects of the disease to disappear, it is often the only evidence that the syphilitic diathesis is not entirely extinguished (*latent syphilis*).

The syphilitic glandular hypertrophies, in persons who are in other respects well, never attain such large proportions as the scrofulous hypertrophies. The former are smooth on their upper surface—the latter nodular and uneven. Syphilitic swellings of the glands, under favorable conditions, gradually grow smaller and disappear, or they undergo fatty, calcareous, or amyloid degeneration. Scrofulous glandular hyperplasiæ frequently become inflamed from very slight external causes, and pus forms in several places. The pus becomes inspissated, fatty, calcareous, or degenerates into a cheesy substance; but in the end the tumor ruptures at several points, and torpid ulcers of the skin, with livid undermined edges, originate, which now secrete a thin, sticky, adhesive matter, and then again an inspissated cheesy discharge, and heal by the formation of contracting, radiating cicatrices.

Morbid Lesions of the Skin caused by Syphilis (Syphilitic Diseases of the Skin—Syphilides).

Syphilis produces on the skin the first and the most frequent morbid alterations. Alibert has included them all under the common name of "syphilides." The nature of the morbid process upon the skin, like all syphilitic forms of disease, is due to chronic, circumscribed inflammations and circumscribed formation of new connective tissue. Active granular and cellular proliferations take place at the affected places. The granules and cells are either reabsorbed, or they degenerate into pus-corpuscles, or become transformed into connective-tissue cells and fibers. These processes produce either dry or purulent eruptions. The dry eruptions are represented by the maculæ, papules, nodules, and tubercles; the purulent by vesicles, pustules, and rupia. These eruptions, however, are also produced by the most varying morbid conditions not allied to syphilis. Hence, there are no eruptions that belong exclusively to syphilis; the latter imitates all eruptions of the ordinary affections of the skin.

The resemblance of the syphilides to the non-specific diseases of the integument, the form and the kaleidoscopic appearance of the eruptions, as also the variable degree of the metamorphoses they undergo, always make the diagnosis of syphi-

litic affections of the skin exceedingly difficult. The following signs will aid us in forming a diagnosis in specific diseases of the skin:

(1) The *markedly circumscribed* form of some of the eruptions. Even the so-called areola, when present, does not merge gradually into the normal skin surrounding it, but ends abruptly.

(2) The *peculiar color* of some of the syphilitic eruptions. The red color, namely, of syphilitic maculæ, papules, areolæ, nodes, and partly also of cicatrices, is not like the fresh, rosy, red color of the corresponding non-syphilitic eruptions and scars, but is a dull, brownish-red, resembling somewhat the color of bacon when cut into, or of tarnished copper. This peculiarity is not equally marked in all stages and phases of the disease. The more recent a syphilide, the shorter the time that has elapsed since the period of infection, the sooner it appears, and the more superficial the eruptions—the brighter the red color will be; the older the syphilide, the more slowly it develops, the later it appears after the infection, and the deeper the layers of the skin are involved in the eruptive process—the more marked will be its brownish or coppery color. After their involution, the eruptions leave a brownish stain of the skin, that gradually merges into blue or grayish-blue color. Cicatrices that form after the healing of syphilitic ulcerations also present, at first, a similar brownish-red color; but the older and firmer they become, the whiter they grow. So long as a cicatrix has this color, it is liable to break open anew, and the syphilitic diathesis is not cured. The cause of this coppery color, according to our investigations, is to be found in the pathological composition of the eruptions, and is due to a teleangiectasis (as in acne rosacea) and to a passive stasis and transudation of the coloring-matter of the blood. The simple hyperæmia of the cutaneous capillaries gives rise to the rosy color, the dilatation (more or less) of the developed vessels to the dark-brown or brownish-red color, while the dull brownish discoloration is the result of the transudation of the coloring-matter of the blood. In badly nourished, feeble persons, especially women, this transudation is so great as to constitute actual hæmorrhage; bluish-red, small and large spots and swellings then originate in the depending parts of the

body. Passive stasis and the transudation of the coloring-matter of the blood are also promoted by a depending position, as is the case in the legs, etc.

(3) The *location* of the syphilitic eruptions. As is well known, syphilitic eruptions have a predilection for certain regions of the skin—for instance, the forehead and nape of the neck, where the hairs cease to grow, the entire scalp, in the groove between the alæ nasi and cheek, commissures of the lips, the navel, and anal folds; on the common integument of the genital organs and their vicinity, especially the inguinal and genito-crural fold of both sexes; lastly, between the toes, in the hollow of the hands, and soles of the feet. Again, certain forms of syphilide have a predilection for certain localities. Syphilitic cutaneous nodules are met with more frequently at the root of the nose, on the temples, scalp, scapular and clavicular regions, over the sternum and tibiæ, while no erythematous eruptions occur on the face, back of the hands, and feet. Lastly, certain specific eruptions, like plants, undergo marked modifications in their development according to their locations. On the parts of the skin that are provided with an abundant layer of fat and large sebaceous glands, whose secretions, in addition, are augmented by permanent frictions—for instance, the anal fold—moist papules grow exuberantly; while on those places where the sebaceous follicles are totally absent (the hollows of the hand and soles of the feet) the papules rise scarcely above the level of the skin. Indeed, the sebaceous and hair follicles seem to promote the development of certain eruptions: thus, the impetiginous syphilitic eruptions seem to prefer the hairy part of the face and scalp. The ecthyma-like syphilitic pustules develop oftener on the scalp and legs than on any other part.

(4) The *quantity and successive forms* of the specific eruptions. The first eruption that appears after infection consists of numerous but scattered inflammatory spots. The longer the time that has elapsed since infection, the more pronounced the inflammatory foci will be, and the more deeply will they penetrate the skin, but the less numerous will they be and aggregate in certain places, seemingly preferring to form circles and curves.

(5) The *polymorphous form* of the syphilitic eruption. The simultaneous occurrence of maculæ, papules, and pustules of various kinds, which, owing to the protracted character of syphilis, may already be undergoing resolution in some places, while new ones are developing in others, occasions the most dissimilar modifications in the eruptions on the different parts of the body, though identical in their fundamental form. This gives the syphilitic diseases of the skin such an unusual polymorphous picture that this symptom constitutes one of the most important aids in the differential diagnosis from the analogous non-specific diseases of the skin.

(6) The *construction of the scales and crusts* of the syphilitic eruptions. Specific eruptions never generate such thick scales as non-specific eruptions, and their color is never as bright and silvery as is the case, for instance, in psoriasis vulgaris, being more of a dirty-yellowish or grayish-white color (psoriasis syphilitica), (*nigricans* of Cazenave). The scales of syphilitic papules consist of the cast-off epidermal covering—in other words, of old, dead scarf-skin—while the scales of psoriasis vulgaris consist of recent though diseased epidermal cells. The dark color is due to the pigment, which, as we have already stated, the syphilitic inflammatory process deposits in large quantities.

On the other hand, specific pustules produce thicker crusts than the non-specific pustules of corresponding dimensions. This is readily explained by the extremely tedious course of the syphilitic eruptions. By the prolonged suppuration, not only a greater quantity of material for the formation of crusts is generated, but the crusts that have already formed constantly absorb pus from the suppuration that goes on beneath them, and they grow more succulent and larger. Non-syphilitic pustular eruptions develop more rapidly, and dry up completely into a scab. Hence, in the latter the scabs shrink up more and adhere more firmly to their bases, while the crusts of syphilitic eruptions swim as it were upon the pus beneath them. By adhering a long time to the skin, the soft syphilitic crusts become dirty from particles of dust, etc., that accumulate upon them.

(7) The *peculiar form of the syphilitic ulcer*. As a pecul-

iarity of the ulcer produced by constitutional syphilis, the kidney or horseshoe form is spoken of—i. e., it presents a concave surface at one place which is already healing, and a convex surface at another that still ulcerates. This form of ulceration is not met with in all sores produced by secondary syphilis; and, moreover, it occurs even in ulcers of non-syphilitic origin—for instance, lupus scrophulosorum. It is met with most frequently in the aggregating nodular syphilides (falsely called lupus syphilitica), in secondary ulcers preceded by rupia and ecthyma pustules, and in instances of new ulcerations resulting from the reopening of cicatrized sores.

(8) The *itching of the skin* caused by syphilis. It is asserted by some writers that the syphilides cause neither itching nor pain. This negative characteristic, however, does not properly belong to all the syphilides. The moist papules on the fundament and near the genital organs give rise to severe itching that causes violent scratching, and when they become ulcerated, for instance, around the anus or between the toes, are intensely painful. Papular and nodular syphilides in the stage of desquamation, especially those on the scalp and in the beard, that form crusts, occasion a marked degree of itching.

(9) The peculiar odor of the *exhalation* and *transpiration* ascribed to syphilitic patients by some writers is not produced by syphilis, *per se*, but by the decomposition and putrefaction of the discharges from the moist papules, the sebum, the perspiration, and the pus from numerous pustules, or the ichor from skin and osseous ulcers, or by a stomatitis mercurialis.

All of the above-mentioned morphological peculiarities being only of relative diagnostic value, the physician, in order to make a positive diagnosis, will have to take into consideration all the morbid lesions that occur in other tissues and organs simultaneously with the skin-diseases. These coexisting phenomena or *concomitantia* of syphilitic disease of the skin are hyperplastic enlargement of the lymphatic glands, the falling out of the hair (alopecia), affections of the nails, of the mucous membrane, of the bones, of the iris, etc. We must here emphasize the proposition that the physician should not be content with making a diagnosis of syphilis from *one* symptom only, but from the sum total of *all the symptoms* present.

Definition and Classification of Syphilitic Skin-Diseases.

Assuming, like Biett and Bassereau, according to Willan's principles, the elementary form of eruptions as a basis for classification, we divide the syphilides into the following forms:

(1) The erythematous form:
  (*a*) Erythema maculosum.
  (*b*) Erythema elevatum or papulatum.
(2) The papular form:
  (*a*) Syphilis papulosa lenticularis.
  (*b*) Syphilis papulosa miliaris.
  (*c*) Psoriasis palmaris et plantaris.
  (*d*) The moist or humid papules.
(3) The pustular form:
  (*a*) Acne pustular syphilide.
  (*b*) Impetigo pustular syphilide.
  (*c*) Varicella pustular syphilide.
  (*d*) Ecthyma pustular syphilide.
  (*e*) Rupia.
(4) The tubercular form:
  (*a*) Superficial syphilitic cutaneous nodes.
  (*b*) Deep syphilitic cutaneous nodes.

1. The Erythema Syphilide, Erythema Syphiliticum Maculosum et Papulatum, Roseola Syphilitica, Syphilitic Spots.

By erythema syphiliticum is understood that affection of the skin originating from syphilis which manifests itself by the formation of roundish, sharply defined, superficial inflammatory foci or spots, of the size of a lentil, pea, or even larger. If acute, the eruption is of a bright-red color, and then lasts only from eighteen to twenty-four hours; but the longer it lasts, the duller or more brownish-red it becomes, changing finally to lead or graphite gray. On pressure, the color does not disappear entirely.

Syphilitic erythematous eruptions consist either of smooth spots which are not raised above the level of the skin (erythema syphiliticum maculosum or roseola syphilitica), or of those which are provided with small papular swellings, or dots

(erythema syphiliticum papulatum). The last form is only a grade higher than the former; for in acute cases it appears simultaneously with the first (erythema syphiliticum maculo-papulatum). Both eruptions are based upon a circumscribed inflammatory process in the papillæ of the cutis; still, the sebaceous and hair follicles also undergo marked pathological alterations. Biesiadecki regards macula syphilitica as a circumscribed hyperæmia of the blood-capillaries, resulting either in hæmorrhage or transudation of the blood, with consequent discoloration. The walls of the blood-vessels of the papillæ and of the corium are permeated and surrounded by newly formed cells and granules.

Erythematous syphilitic eruptions are found in greatest numbers on the trunk, especially on the sides of the chest, groins, and abdomen. The neck, the sternal region, and the face generally, are free from spots; but on the forehead, where the hairs cease to grow, numerous eruptions originate. On the extremities they are usually only found at the bends of the elbow and inner surface of the thigh. They very seldom extend upon the forearm and leg down to the wrist and ankle; but when this happens to be the case a few erythematous patches of the size of a lentil or millet-seed are found scattered upon the palm of the hand and sole of the foot (psoriasis palmaris and plantaris). No macular eruptions are found on the skin of the genital organs, except the penis. If a balano-blennorrhœa be present at the same time, the spots or papules will be transformed into elevated, sharply defined, bright-red, moist or easily bleeding erosions, and they may be mistaken for superficial chancrous ulcers.

The development of erythema syphiliticum is generally preceded by the previously mentioned specific eruptive fever. The more intense the latter, the more numerous and pronounced will be the efflorescences. If no eruptive fever occurred, or if the patient was treated with mercurial or drastic purgative remedies, soon after the appearance of the Hunterian chancre, the spots of eruption will be few in number and appear slowly. After indulgence in excesses, exhausting marches, or in consequence of violent depressing mental disturbances, the erythema attacks the entire skin within twenty-

four hours. Its slow development is the rule; but, compared to the other syphilides, it develops more quickly and comes on earlier after the infection. Neither the season of the year, nor age, nor sex exercises any influence upon its development; the temperature affects it to a certain extent, inasmuch as high temperature renders the spots less distinct, and low temperature brings them out brighter against the pale surrounding skin.

In exceedingly rare cases, the erythematous syphilide is of very short duration (roseola syphilitica evanida of the old writers). As a rule, it will remain unchanged for many weeks, even years, if not interfered with by treatment. Although a mercurial treatment may dissipate the eruption in about fourteen days, still it often happens that, during and notwithstanding the treatment, the elementary form of the syphilitic eruption develops markedly, and desquamating papules and pustules result from it. The reason why erythematous efflorescences in some persons occasionally merge so quickly into other eruptions that it is entirely overlooked, while in others syphilis persists in the form of an erythematous syphilide, is due neither to the concentration of the absorbed virus, nor to the character of the infecting foci, nor age, nor season of the year, but to the constitutional condition of the infected individual. The syphilitic erythema always disappears by resolution, leaving behind a brownish-gray mark (lentigines or ephelides syphilitica of the old writers). It occurs as often in congenital syphilis as in the acquired form. The erythematous spots, when the eruption relapses, are larger (three to four millimetres) than the primary ones, and are sometimes aggregated in circles. They occur mostly on the abdomen and the lower part of the chest—less on the back. The relapses which manifest themselves as erythema syphilitica generally come on a little while after the first eruption disappears. Still, we had one opportunity of seeing a relapse of this kind occur one year after the first erythema vanished. A relapse may take place so long as the Hunterian primary lesion or the discolored spots of the first eruption are not entirely gone. Febrile phenomena generally do not precede a relapse of an erythematous outbreak, and the spots usually then run a very slow course. An erythema that

relapses is oftener accompanied by psoriasis palmaris et plantaris than a primary eruption.

It seldom happens that a person affected with erythema syphiliticum has not at the same time other forms of efflorescence on some part of his body. Especially is this the case on those parts of the body where no erythematous eruptions ever occur; for instance, on the scalp, in the face, and around the large orifices. Thus, in patients who have not been subjected to mercurial treatment, there are often found on the scalp in the third or fourth week of an existing syphilitic erythema, numerous, irregularly scattered, small, black, firmly adhering, or brittle crusts, as big as a millet-seed or larger, of a brownish color, or numerous yellowish or whitish small bran-like scaly scabs form there which are easily detached, and which are the result of augmented secretion of the sebaceous follicles of the scalp (seborrhœa sicca congestiva). Similar small crusts of the sebaceous glands, situated upon a reddened base, are found in the crevices of both alæ nasi. In addition, similar impetiginous crusts, situated upon papular elevations, occur with equal frequency in the beard and mustache.

On the nape of the neck, close to the scalp, also here and there on the trunk, there are found, after the syphilitic erythema has lasted several weeks, a number of lenticular papules in various stages of development. Beginning psoriasis palmaris et plantaris is not so frequently observed in connection with syphilitic erythema.

On obese persons, an intertrigo-like affection develops on the external genital organs, especially in the genito-crural fold and anal fissure. This condition generally encourages the formation of confluent, moist papules. According to our experience, half of the patients who are affected with erythematous syphilides suffer also from moist papules on the genital organs.

At the angles of the mouth diphtheritic exudations are often found, which merge into the mucous membrane of the mouth, and here present only an opacity of the epithelial cells (*plaques muqueuses* of the French writers). Likewise, the mucous membrane of the tonsils, soft palate, and uvula, has a bluish-red color; here and there it is milky, opaque. The hairs also

suffer a lesion of nutrition; they lose their gloss, and fall out at various places.

Now and then some feebly marked periostoses, on the anterior surface of the tibia, cranium, etc., are met with in connection with syphilitic erythema. In some cases, varicella-like vesicles occasionally form on the trunk, while the presence of acne-like or ecthyma-like pustules on the legs is not infrequent.

Finally, it is evident that, in patients suffering from roseola syphilitica, the lymphatic glands accessible to the sense of touch must be more or less enlarged.

Of all the diseases of the skin, erythema syphiliticum may be regarded as the most favorable form, inasmuch as it may disappear in a short time without leaving any pathological alterations of the skin behind. The morbid lesions in other tissues occurring in connection with it are also less obstinate to treatment, and assume a more favorable course. When the syphilis, after a long interval of apparent recovery, recurs again in the form of an erythema, the latter is to be regarded as a favorable prognostic sign, in so far as it indicates that the graver specific forms of the disease are incapable of affecting the system.

In regard to the differential diagnosis, syphilitic erythema presents many similarities to some of the non-syphilitic eruptions of the skin, such as *morbilli*, *rubeola*, *scarlatina*, and *roseola typhosa*. These typical exanthemata differ from syphilitic erythema by the severe febrile phenomena, which continue even after the above-named eruptions have appeared, by the higher temperature and uniform hyperæmia of the skin, by the location of the efflorescences, by the accompanying catarrhal symptoms (in morbilli and roseolæ), by the intense angina (in scarlatina), by the splenic tumor (in typhoid fever), and, finally, by the duration and the whole course of the affections.

The resemblance of specific erythema to *urticaria* and *roseola balsamica* was the cause that misled physicians, Cazenave among others, to regard the virus of gonorrhœa as identical with that of syphilis. Now, roseola balsamica occurs only in some of the patients suffering from gonorrhœa who are treated by the internal administration of balsam of copaiba, cubebs,

turpentine, etc., and disappears eight or ten days after the use of these remedies is discontinued, without leaving any discolored spots. It is attended by intolerable itching and burning. The violet-red efflorescences are of the size of a pea, have a tendency to aggregate in groups, especially in places where pressure is constantly kept up, generally coalesce, and then the skin, swollen and of a violet-red color, is seen covered with brownish-red wheals. The temperature of the skin is considerably increased. Lastly, roseola balsamica is always attended by gastric disturbances. In addition, the chemical reaction of the urine, upon the addition of a strong mineral acid, which has already been mentioned in a former section, affords us sufficiently reliable evidence in differentiating the two exanthemata.

In some *very rare* cases the internal use of mercury produces an erythematous affection of the skin, which may be mistaken for the syphilitic form. *Erythema mercuriale* produces not scattered, but confluent efflorescences, and large parts of the skin assume a bright-red color. It is localized, as in a case we had an opportunity of seeing, on the flexor surface of the forearm, and on the leg and trunk. It likewise causes a prickling sensation, and disappears quite quickly when the use of the mercurials is discontinued.

Relapsing erythematous syphilides that appear in circular groups resemble very much erythema circinatum, or annularis. The acute course of the non-syphilitic erythemata, the almost exclusive appearance of the eruption on the back of the hand and foot, and its rapid resolution, afford sufficient guide for a diagnosis.

The discolored remnants of extinct erythematous and papular syphilides—in fact, all discolored spots produced by specific inflammatory processes—may be mistaken for *pityriasis versicolor*. This affection of the skin, however, is distinguished by the following features: The brownish spots of pityriasis are caused by the accumulation at certain places of discolored epidermal cells, the dark color of the syphilide is due to collections of coloring-matter in the rete Malpighii; the former may, therefore, be scraped off with the nail, or removed by baths and lathering; the latter can not be so removed. The solitary

spots of pityriasis versicolor coalesce after a while, and form irregular stains as large as the palm of the hand. This never occurs in syphilides. If, in addition, the fungi-spores, microsporon furfur, and thallus fibers of pityriasis versicolor are seen with the microscope, in the scraped-off scales, all sources of diagnostic error will be avoided.

2. Papular Syphilides.

The papular syphilide is characterized by plano-convex, sometimes acuminate, painless nodular elevations, of the size of a poppy-seed, or even of a lentil, which, according to their location, will be more or less advanced in the process of evolution or involution. These elevations constitute minute granules or kernels, covered with a markedly dry, glossy skin, with or without a crust. Sometimes small granules with broad bases are seen, and, from their upper surface, in consequence of the softened condition of their epidermal covering, exudes a minute quantity of moisture. The color of the syphilitic papule at first is bright red, but subsequently becomes brownish-red. After desquamation has taken place, the papule acquires a glossy, livid color, and, the more the resolution goes on, the more it grows dirty-yellowish or bluish-gray. Under the pressure of the finger, the developed papule turns yellowish.

The specific papule develops from small or large brownish-red spots which gradually rise above the level of the skin. According to the size, we distinguish a *miliary* and *lenticular* papule. The syphilitic papule never attains a large size on the palm of the hand or sole of the foot (psoriasis palmaris and plantaris), while in the vicinity of the genital organs it sometimes attains enormous dimensions (moist papule).

This pathological process is caused by perifollicular and papillary cell-infiltration. The former occurs especially on those places where the sebaceous and hair follicles are best developed: for instance, around the anus and the genital organs, in the axillary region, and, where the scalp merges into the hairless skin, on the forehead and nape of the neck.

The papular syphilide originates most frequently from acquired syphilis; congenital syphilis very seldom produces it.

If the infected person was not treated with mercury or drastic purgatives, it develops soon after the appearance of the Hunterian primary lesion, a few days later than the erythematous syphilide, from which, in fact, it is apt to originate. It appears, therefore, at about the eleventh or twelfth week after infection. But if the patient was put upon an antisyphilitic treatment soon after he became infected, this manifestation of syphilis may be postponed for an indefinite time, as we have stated before. Only a few papules will then develop, and these are arranged in circles, segments of circles, or ellipsoids.

Large as well as small papules may be absorbed before they undergo any pathological transformation, especially with the aid of medicine. They leave behind almost black or bluish-red discolored depressions, which gradually become smooth and disappear.

But if no treatment is instituted—sometimes, indeed, in spite of it—the papules undergo absorption, by passing through the most remarkable morbid changes. The epidermal covering of the papule is raised and forms a dry, grayish scale. The latter falls off and is renewed again and again till the desquamating place has become level with the skin. The papules that have already cast off their scales present, on their flattened surface, a bluish tint and a gummy gloss, and are surrounded by a whitish, undermined epidermal border. The removal of the epidermal covering of the papule, however, does not always take place by the dry process; often it is the moist process which brings about that condition. Twelve or fourteen days after the papule appears, a serous effusion forms under the epidermal cover, thus causing, according to the size of the papule, the formation of a large or small vesicle. The contents of this vesicle, however, are soon absorbed or inspissated by evaporation, and conjointly with the elevated epidermal cover form a thin crust, which again undergoes desquamation. This process rarely happens in the lenticular papule, and in the moist papule it escapes observation so easily, that but few writers mention it. Miliary papules, especially when they appear under an acute form, are generally transformed into small pustules.

(*a*) *Lenticular, Papular Syphilide.*

The lenticular, papular syphilide is generally preceded by a more or less severe eruptive fever. Nevertheless, the efflorescences are not very numerous, but appear in a certain degree of pathological order, so that at least eight or ten days elapse before the eruption has attacked the whole trunk. The first indications of the eruption are slightly elevated dark-red spots, of the size of a lentil, generally originating on the nape of the neck and on the forehead along the line where the hairs cease to grow (corona venerea). While the papules at these places advance in their development and metamorphosis, or have already undergone some retrogressive changes, new papular efflorescences appear all over the trunk, especially on the back, sides of the chest, and sometimes on the abdomen. Generally they are pretty evenly scattered; still, over the scapular and sacral region, and in the genito-crural fold, they are more aggregated. On the anterior surface of the upper extremity, the lenticular papules are less numerous and not so well developed. They are more numerous, and tend to coalesce at the bend of the elbow and wrist. On the lower extremities they are located in the greatest numbers on the internal, in less numbers on the external and posterior surface of the thigh; on the leg they occur almost exclusively in the bend of the knee, where two or three of them are usually found grouped together. On the dorsum of the hand and foot syphilitic papules are very rarely found. In the face the lenticular papule is equally rare; and when seen here it is not as papula disseminata, but arranged in circles, especially when it occurs in the dimple of the chin.

Notwithstanding its acute commencement, the course of a lenticular papular syphilide is always protracted. If not modified by treatment, the papules remain stationary for a long while, or they desquamate several times in succession. After desquamating, frequently or rarely, the papules constantly grow more brownish-yellow, flat, and finally disappear by resolution. The places where they were situated are marked for months by coppery-brown or bluish-gray spots of the size of a lentil.

The duration of a lenticular papular syphilide naturally de-

pends, like that of any other syphilide, upon the life the patient leads and the treatment he gets. If he is not treated at all, the above-described desquamation will ensue in about fourteen days on some places, while new papules will appear on others. This disappearance and reappearance of new papules may go on for a long while; however, later they are not so numerous, and are located in some places in circles, segments of circles, and ellipsoids. Under an appropriate treatment a papular syphilide usually disappears in from two to three months. The treatment with iodine, as a rule, requires a slightly longer time to effect a cure.

Mixed in between the lenticular papules of various phases, there occur developed or retrograding miliary papules and erythematous efflorescences. Acne and ecthyma pustules are also met with here and there, especially on the legs. On the palms of the hands and soles of the feet there are found the traces of psoriasis palmaris and plantaris, and moist papules on their favorite places. The falling out of the hair and the disease of the nails are of more frequent occurrence, and last longer in papular than in erythematous syphilide, and crusts are found correspondingly oftener in the beard and scalp.

In regard to the lesions in other tissues, the swellings of the glands have, by this time, become more marked, and affections of the mucous membrane and enlargement of the tonsils, especially in relapsing papular syphilide, are more often observed. Iritis syphilitica is usually found accompanied by papular syphilis. The morbid alterations of the bones are similar to those occurring in erythematous syphilide.

An apparently cured syphilis may relapse and manifest itself, even after many years, by a papular syphilide. The relapsing papular syphilide is distinguished from the primary eruption by the fact that the efflorescences form on a few (one or two) places only large or small circular, ellipsoid, or curved lines or groups; and, further, that no other forms of eruption occur between the relapsing papules.

(*b*) *Small Papular Syphilide* (*Syphilis Papulosa Miliaris*).

The small papular or miliary papular syphilide is so called on account of its minute size, being hardly larger than a millet-

seed. It appears, as a rule, in a very acute form, so that in twenty-four or forty-eight hours large tracts of skin are covered with numerous groups of efflorescences. Another effect of the acute appearance of the granules is, that they have hardly developed when they become acuminated, and the apices are converted into minute vesicles or pustules. Miliary papules are mainly located in the face, on the back, and, like lenticular papules, in the palm of the hand and sole of the foot, in the genito-crural fold, in the anal crevice, and about the genital organs (modifications of psoriasis syphilitica palmaris et plantaris and moist papules already mentioned).

However acutely a miliary papular syphilide may be ushered in, it assumes the protracted character in a few days, especially after the vesicular metamorphosis has ensued. The scales that form after the contents of the vesicles have become inspissated, gradually fall off and leave bluish-red cicatricial depressions about the size of a pin's head. These depressions correspond to the excretory ducts of the diseased sebaceous and hair follicles, and disappear in a few weeks without leaving any traces. Sometimes a lenticular papule develops upon the discolored spot remaining after the miliary efflorescence has disappeared.

The vesicular stage of a miliary papular syphilide lasts only a few days. The conical papule upon which the vesicle is situated persists for several weeks and months, according to the condition of the patient and his mode of living.

Miliary papular syphilide, like the lenticular variety, terminates in resolution, with or without desquamation, and leaves no cicatrices.

This eruption is associated with erythematous spots and moist lenticular papules. The phenomena that occur in other tissues are analogous to those which accompany the lenticular papular syphilide; but in the miliary form the falling out of the hair is more marked.

This eruption is *less frequent* than the lenticular variety; in the female it occurs somewhat more often than in the male.

Relapses of syphilis under the form of miliary papular syphilide are rare; as a rule, the recurring syphilitic eruption, following a miliary papular one, will be of the pustular variety.

Relapses of miliary papules occur either in groups, or they constitute lines arranged in circles or half-circles of desquamating granules. They are especially located on the forehead, on the nape of the neck, on the scapular region, or the internal surfaces of the upper and lower extremities.

The prognosis with regard to the blood-poisoning at the bottom of the disease is less favorable than that of the erythematous form, because the morbid alterations in the various organs and tissues, which coexist with the eruption under consideration, are more pronounced and more obstinate. Regarded locally, the prognosis is favorable in so far as the eruption leaves no discoloration of the skin.

The desquamating papular syphilide which many authors consider as a genuine syphilitic disease of the skin under the name of "psoriasis syphilitica," may easily be mistaken for *psoriasis vulgaris* guttata or punctata. The following are the differential features of the two forms of the disease: In psoriasis syphilitica, the scale, as a rule, consists of a thin, yellowish, cast-off epidermal lamella; while in psoriasis vulgaris the scales may be scraped off in branny flakes. In psoriasis vulgaris the brilliant white flake penetrates deeply into the rete mucosum; in papular syphilide the scale is formed from the epidermis raised up by the papule. The base of the syphilitic papule is light brown; in psoriasis vulgaris there is no discoloration at all, or it is bluish-red, especially on the legs. Syphilitic papules that are covered with scales never become confluent like the flakes in psoriasis vulgaris (psoriasis vulgaris diffusa). At the most they form, when a relapse ensues, a few circles or segments of circles, in which the contours of each papule remain distinct. Psoriasis vulgaris occurs on the scalp and ears, where desquamating papular syphilide never occurs. Further, it appears more on the extensor than on the flexor surfaces of the extremities, and especially on the tip of the elbow and over the patella; while the so-called squamous syphilide is found more on the inner surfaces of the extremities, and very seldom on the elbow and knee, or the dorsum of the hands and feet. Psoriasis vulgaris inveterata produces a circumscribed thickening of the skin that is covered with scales; desquamating papular syphilide scarcely ever causes any thickening of

the corium. While papular syphilide is almost always accompanied by marked falling out of the hair, this is not noticeable in psoriasis vulgaris, even when it attacks the scalp.

The efflorescences of miliary papular syphilides resemble somewhat *scabies*, on account of which Plenk described them as scabies venerea. The violent itching produced by scabies, and the excoriations caused by the violent scratching, and, above all, the finding of the acarus scabiei, will decide all doubts concerning the nature of the malady.

The resemblance of *lichen scrophulosorum* to the small papular syphilide formerly caused the latter to be called lichen syphilitica, and, according to the arrangement of the groups of the eruption, disseminatus or corymbosus. The granules of lichen scrophulosorum, being no bigger than hempseed, present no striking contrast by their color to the surrounding skin, and under anti-scrofulous treatment disappear in a short time, leaving neither discolored marks nor scars, while the small papular syphilides leave behind for a long time livid colored depressions as big as a pin's head.

A relapsing small papular syphilide may be mistaken for *herpes circinatus*, and, owing to the resemblance between these two eruptions, Ricord called it herpes syphilitica circinatus. The very acute course of the herpes vesicles, which barely last more than a day, and quickly dry up into small scabs, and thus form a large or small circlet or wreath of scales situated upon a slightly inflamed base, the microscopical demonstration of fungi-spores and thallus fibers, the favorable local effect of preparations of potash are sufficient differential data to prevent an error in diagnosis.

(*c*) *The Papular Syphilide, or Squamous Syphilide of the Palms of the Hands and of the Soles of the Feet* (*Psoriasis Palmaris et Plantaris*), *and Syphilitic Diffused Affection of the Epidermal Strata of the Hands and Feet* (*Syphilis Cornea*).

The squamous syphilide of the palms of the hands and of the soles of the feet in reality is a papular syphilide, whose solitary efflorescences are but poorly developed, while the epidermal affection becomes markedly noticeable, owing to the

thickening and continuous exfoliation of the skin. On the other hand, there is also an affection of the epidermal stratum of the palm of the hands occasioned by syphilis, which is due to morbid corneous degeneration of the epidermis, without the formation of papular efflorescences.

There originate on the palms of the hands and soles of the feet circular, dull red spots, varying in size from that of a lentil to that of a pea, which gradually rise slightly above the level of the skin. After a while the eruption changes its color, and becomes reddish-brown. When involution of the elementary efflorescences begins, the epidermal covering either becomes thickened in the center of the papule only or throughout, resulting sometimes in acuminated, then again in lamellated swellings or callosities. These hypertrophies are, however, gradually cast off spontaneously, the exfoliation beginning at the center and progressing to the periphery, or they are detached by the patient. They are nothing more than lamellæ of dead epidermis. The diseased place, after the removal of the callosity, forms a bright-red, brilliant, attenuated circular spot covered by a delicate epidermal disk, corresponding in size to the efflorescence, and is surrounded by a border of undermined skin. In some cases the corneous transformation takes place only in the center of the papules to the extent of a poppy-seed, and after the corneous portion has dropped out they form disks, in the center of which the epidermis has disappeared over a surface as large as a pin's head.

The eruption that has just been described, however, is not always circular in form. On the palms of the hands and soles of the feet there are no sebaceous or hair follicles, upon whose shape the round form of the syphilitic papule depends. The aggregation of the inflammatory cells within it, and likewise between the rete Malpighii and the epidermal stratum, may go on unhindered and irregularly. On the other hand, the firmness with which the cutis adheres to the subjacent fascia, and the thickness and diminished distensibility of the epidermis, may be the cause of the flatness of the efflorescences on the places under consideration.

In most cases a few (four or five) spots form at first; these are gradually followed by more, all being scattered and at a con-

siderable distance from each other. When a papular syphilide appears in a subacute form, the soles of the feet and palms of the hands, along with the volar surfaces of the fingers, are covered with numerous erythematous spots or papules. When the disease has existed for a time, the scattered efflorescences coalesce and then form, especially in the fissures of the palms of the hands and on the volar surfaces of the fingers, longitudinal epidermal hypertrophies or exfoliations.

In most cases the vola manus and planta pedis are simultaneously attacked. There are, however, many cases in which the disease occurs only in the palm of the hand, and rare cases in which only *one* palm and *one* sole are diseased.

In some cases psoriasis palmaris or plantaris may get well without medical aid. In most cases, however, new eruptions originate near those already desquamating, recurring even on the places that have exfoliated. The efflorescences thereby become confluent and lose their circular form. On the other hand, the diseased epidermal cells accumulate in large quantities, thick patches of skin exfoliate, resulting, especially in the grooves of the palms of the hands and soles of the feet, in cracks or fissures—" rhagades syphilitica "—which cause severe pain at every movement, and sometimes slight bleeding. So long as there are only lenticular spots, resolution may be effected in about fourteen days by treatment with mercury; but, if callous thickening of the epidermal covering of the efflorescences and desquamation have already taken place, the disease will last for months, even years—papular syphilide of the palms of the hands and soles of the feet being now regarded as one of the most obstinate diseases. Psoriasis palmaris and plantaris syphilitica very frequently relapses, and sometimes returns after many years. Indeed, save the falling out of the hair and the swelling of the glands, it is usually the only symptom of relapsing syphilis.

Still another syphilitic affection occurs in rare cases on the palms of the hands and soles of the feet. In contradistinction to the maculo-papular form of psoriasis palmaris and plantaris, it is known as *psoriasis syphilitica palmaris*, or *plantaris diffusa*, or *cornea*. It consists of a uniform diffused, rapid corneous degeneration of the most superficial layers of the

skin, whereby the affected places look as if the epidermis were transformed into a fine, whitish silver-brocade.

In the vast majority of cases psoriasis palmaris and plantaris syphilitica occurs in connection with erythema syphiliticum maculo-papulosum and papular syphilides, especially the relapsing form. In rare cases syphilitic acne and varicella efflorescences are found along with it; usually, however, marked falling out of the hair and onychia syphilitica occur at the same time. In very marked psoriasis palmaris we have seen not infrequently a lymphangioitis, commencing at the wrist-joint and extending toward the internal surface of the forearm.

Although psoriasis palmaris and plantaris often obstinately resists all kinds of treatment, nevertheless it is a good omen for the patient, and we are relieved of the apprehension that dangerous purulent infiltration of some delicate organs, or that exudation under the periosteum, etc., was impending.

It is most frequently mistaken for psoriasis vulgaris palmaris and plantaris; likewise for ordinary eczema of these regions.

Psoriasis vulgaris palmaris and plantaris differs from psoriasis syphilitica in producing much larger and more scattered plaques than the latter. The attacked places, being deprived of scales, display in vulgar psoriasis a more livid color, while in the syphilitic form the well-known coppery color is quite distinct. The epidermal scales of psoriasis vulgaris are much larger and more difficult to remove than the scales of psoriasis syphilitica; the scales of the latter represent the hypertrophied epidermal lamellæ, while the scales of the former are an agglomeration of diseased epidermal cells. The scales of psoriasis vulgaris form an elevation with a central prominence, while the scale of psoriasis syphilitica is defective in the center. Psoriasis vulgaris of the parts in question is always associated with general psoriasis, while psoriasis palmaris and plantaris caused by syphilis either occurs alone, or is attended by specific affections in other organs and tissues of the body.

Eczema palmaris develops in the form of scattered or grouped hyaline vesicles, whose contents may be absorbed or evaporated, whereupon parchment-like hypertrophied patches of epidermis as big as a pin's head remain. If the latter hap-

pens to be arranged in groups the exudative substance may be pulled off in the form of yellow, thickened epidermal plates of the dimensions of the diseased spot. When the exudation recurs very often, the epidermis becomes so intensely hypertrophied that, by virtue of its denseness and the xanthoprotein color it acquires, it is best compared to a mummified, parchment-like hide. If a recent eczema vesicle is pricked or scratched open, a gummy fluid will run out. If an epidermal lamella is torn off, there is seen on the surface facing the cutis the negative impression of the former vesicle, but upon the cutis itself a very delicate new epidermal plate having a rosy or bright-red color, which after a few days becomes the site of a new vesicle.

Now, if the development and course of eczema palmare are compared with the already delineated symptoms of psoriasis syphilitica palmaris, the differential signs are instantly recognized. In regard to location, psoriasis syphilitica palmaris develops more in the middle of the hand, while eczema oftener attacks the ulnar and radial margins. Further, in eczema palmaris eczematous vesicles are usually found on the interdigital surfaces, or on the back of the affected fingers, which is never the case in psoriasis palmaris syphilitica. Finally, no form of eczema causes such violent itching as eczema palmare and plantare, while syphilitic degeneration of the epidermis of the palms of the hands and soles of the feet occasions no itching. In some cases, the occupation of the patient may also assist us in the formation of a differential diagnosis, as is the case in eczema of washer-women (psoriasis of washer-women), or in eczema of bakers (scabies pistorum).

(*d*) *The Humid or Moist Papules, or Flat Condylomata; Papules Humides; Pustula Fœtida Ani; Pustules, Plates, etc., of various Authors.*

The moist or humid papules are dry papules metamorphosed by local conditions. On examining a patient affected with recent papular syphilides, a few feebly developed papules covered with dry scales are usually found on the upper and inner surfaces of the thighs. But the nearer the papular eruption approaches the genital organs, the more developed

will the efflorescences be; and the more warty they are, the greater the quantity of viscid, decomposed fetid matter will they discharge. This is especially true of corpulent women who are careless of their personal cleanliness. These moist papules often surround the anal opening like a row of buttons.

The moist papule begins as a dark-red spot, of the size of a lentil, which gradually rises above the level of the skin, and is exactly like the dry papule. But, while a dry scale originates upon a dry papule, the epidermal cover of the humid papule is similarly transformed by moisture into a moist, grayish-white, macerated, easily detached membrane, after whose removal the surface of the papule is seen like a flesh-colored plaque. Now, if these papules, bereft of epidermis, continue to be exposed to friction and maceration by the physiological secretions and pathological excretions from the adjacent skin and mucous membrane, a diphtheritic membrane (molecular détritus) forms upon their surfaces, whereby they acquire an uneven, verrucose, and nodular appearance. If this membrane is forcibly rubbed off, the papule will bleed considerably. It gradually undergoes more and more molecular disintegration, whereby the former papular elevation is so reduced that it is finally indicated only by a grayish-white pseudo-membranous layer, varying in size from a lentil to a pea. If the molecular destruction continues, shallow or deep ulcers, discharging a dirty-grayish matter, are formed. By the coalescence of several such papules undergoing disintegration, or by the progress of the ulcerative process upon the adjacent integument, the papules lose their original round shape, and form polygonal or longitudinal ulcers (fissures). However, all these ulcerative processes, as a rule, only bring about a shallow loss of substance.

The moist papule may, however, undergo still another change under favorable conditions. The newly formed cells of the papular inflammatory foci may develop into connective-tissue fibrillæ, in the same manner as they undergo degeneration. In this case the papule swells up to the size of a pea or bean, and becomes somewhat constricted at its base, while its semicircular surface acquires an uneven, caruncular appearance. In the further course of the process these caruncular

prominences, by luxuriant growth, develop into conical connective-tissue fibrillæ, which branch off dichotomously, as in ordinary condylomata.

Sometimes the molecular degeneration on the ulcerating papules remains quiescent, the diphtheritic membrane partially disappears, and in its place conical cicatrizing connective-tissue bands—i. e., condylomata acuminata—originate from the inflammatory foci.

According to this description, we distinguish the following phases in the development of a moist papule:

(1.) The intact papule.

(2.) The phase of elevation and casting off of the epidermal cover of the papule (pustule crust).

(3.) The diphtheritic phase.

(4.) The phase of the connective-tissue proliferation (syphilis vegetans, condyloma latum).

Not every papule, however, goes through all these phases; it may disappear at any phase, and a cure ensue.

In our opinion, the dry syphilitic papule is due to cellular infiltration of the papilla of the skin; the moist papules, especially those on the edges of the labia and around the anus, to disease of the sebaceous glands. In some cases, moist papules have originated upon cicatrices of chancres, even upon the ulcerating surface of a soft chancre.

In general, moist papules originate on those parts of the skin where large sebaceous and hair follicles are found, where the integument forms deep folds, where two surfaces of the cutis are constantly in contact with each other, causing, by the friction of the parts, an increase of the temperature. Such places are the inguinal and genito-crural folds, the folds produced by pendulous breasts, the perinæum, the pubis, the anal indentation, the labia majora, the axillæ, the interdigital folds, and between the toes and at the navel. The thicker the layer of adipose tissue upon the places mentioned, the more they are irritated by sebaceous, perspiratory, and other secretions, the more exuberantly and abundantly will papules develop. In addition to the places mentioned, the moist papule is met with on the nipples of wet-nurses, the angles of the mouth and lips of smokers of pipes and cornet-players; sometimes on the groove

at the alæ nasi, the meatus auditorus externus, and very rarely in the grooves of the nails. They are found in greatest abundance and more closely aggregated on the margins of the large apertures of the body, where the mucous membrane joins the integument.

The moist papules situated upon the genital organs and around the anus usually produce severe itching, and when they become ulcerated occasion intense pain and functional disturbances. Ulcerating papules around the anus render the evacuation of the bowels painful; those on the surfaces between the toes hinder the patient in walking; those situated on the nipples of the mother or wet-nurse's breast, interfere greatly with the function of wet-nursing, while those situated on the lips of the nursling hinder it in sucking the breast. The decomposing discharge from moist papules not only produces an injurious effect upon other papules that come in contact with them, but also occasion an erythematous inflammation and excoriation of the adjacent parts. Moist papules on the labia, if numerous and undergoing suppuration, will cause the latter to swell enormously, while the absorption of the ichorous matter from those papules situated near the genital organs will give rise to acute enlargement of the indolent inguinal buboes, and result in softening and suppuration.

Moist papules, if situated on parts of the skin that are in contact, will, if not kept asunder by the interposition of bits of lint, etc., and kept perfectly clean, produce similar papules on the opposite surface. This condition, however, is not to be regarded as an instance of spontaneous inoculation, but as an effect of irritation on a part that is less capable of resistance—a morbid lesion reproducing itself by simple impression.

The etiological factor that is capable of generating a moist papule on one place acts also upon the other, and, fostered by the foul secretion of the morbidly changed surface, exercises its effects upon an apparently healthy contiguous part.

Notwithstanding the acute and inflammatory manner in which moist papules are ushered in, they, like other syphilides, run a chronic course. The elevation and removal of the epidermal cover of the moist papule are usually completed in a few days. The diphtheritic stage, however, will last several

weeks; indeed, not infrequently several months, if left without treatment. Under an appropriate local and general treatment, the papules undergo resolution quite rapidly, and will be entirely absorbed, while the vegetations situated upon them, if not removed by escharotics or instruments, will shrink and drop off. As soon as absorption begins, the discharge ceases, and the papule becomes dry. If many moist papules are grouped together, those situated in the *center of the group generally disappear first*, and those on the periphery then form a circle. The non-ulcerating papule, after having been completely absorbed, leaves a copper-colored stain of corresponding dimensions. An ulcerating papule heals by the formation of a very superficial scar, which likewise remains brownish-red. This discolored spot disappears only after prolonged treatment. Occasionally the scar is characterized by the *absence* of coloring-matter in it.

The moist papule is one of the most frequent forms of the syphilides, but it occurs oftener in females than in males. It is usually the prodroma of commencing or recurring syphilitic eruptions. It is, however, not only the product of acquired, but also occurs as a symptom of hereditary syphilis.

No syphilide relapses as often as the moist papule. Relapsing moist papules may reappear upon their former site. They are then usually less numerous the longer the time that has elapsed since infection took place; they discharge less matter and itch less, are less painful and develop more slowly.

The moist papule is not infrequently the only morbid lesion on the skin by which syphilis manifests itself—i. e., a relapse of the first phases of syphilis is often noticeable by the sole appearance of moist papules. As a rule, however, they are attended by the macular and papular and also by pustular syphilides. The lesions which occur in the other tissues are identical with those of the dry papular syphilide.

Confluent moist papules, when a contiguous part of the skin is rendered sore by their discharge, may be mistaken for an *eczema rubrum*. The distinctive signs are: The eczematous skin that is denuded of epidermis generally does not present that dirty-grayish, shaggy appearance which is peculiar to papules covered with molecular détritus. The secretion in

eczema is more profuse and the itching much more severe than that produced by moist papules. Eczema heals from the periphery toward the center; confluent moist papules from the center toward the periphery. In eczema there is found, on the extreme periphery of the affected places, new vesicles, or their former presence is indicated by scales of corresponding dimensions. At the external border of the place on which moist papules are situated isolated ulcerating or non-ulcerating papules are occasionally seen.

Isolated moist papules may be mistaken for a *diphtheritic chancroid.* The slow result produced by inoculations with the secretion of a moist papule on the person bearing it, and still better the course it pursues, will furnish the best proof of the nature of the lesion in question. In conclusion, we will add that a granulating external orifice of a rectal fistula may readily be mistaken for a moist papule.

3. Pustular Syphilide.

By the term *pustular syphilide* we understand a form of skin-disease produced by syphilitic poisoning of the blood, whose efflorescences consist of pustules (according to Willan) which originate from a more or less marked elementary papular eruption. According to the variation of the purulent transformation of this papular eruption, we distinguish different kinds of pustular efflorescences. Thus, if the apex of the papule alone undergoes softening, a pustular syphilide originates that is analogous to *acne* and *varicella vulgaris.* If the entire papular inflammatory focus undergoes purulent metamorphosis, without, however, affecting the corium deeply, the *vesicular* or *impetiginous* form will ensue. But if the purulent softening attacks the corium very deeply, then we have *ecthyma syphiliticum* or *rupia syphilitica.* The most frequent form is ecthyma syphiliticum; less frequent is impetigo syphiliticum; still more rare is acne syphilitica; and the rarest of all forms are varicella and rupia syphilitica.

The pustular syphilides, compared with the dry, occur in the proportions of seventy to one hundred, and generally come on at a later period after infection. The pustular form of syphilis always casts a mournful shadow upon the condition of

the patient, and justifies the fear that the inflammatory foci coexisting in other tissues, as a result of syphilis, are also undergoing purulent metamorphosis.

The accompanying phenomena of pustular syphilides are about the same as those of other syphilides, the only difference being that here we have to deal with a still greater variety of efflorescences. For, in addition to the pustules in various stages of development, there are also present maculæ, papulæ, squamæ—indeed, even ulcers. Induration of the testicle and suppurative paronychia occur oftener in pustular syphilides than in other forms. Enlargement of the glands in general is usually more pronounced than in dry syphilides.

(*a*) *The Acne-like Syphilide.*

By the term *acne syphilitica* is meant a small, generally acuminated, more rarely spherical pustule, upon which a papular inflammatory focus is located. In its further course it dries up, and forms a brownish or yellowish crust. The anatomical site of acne syphilitica, as in acne vulgaris, is the sebaceous and hair follicles. The acneous syphilitic efflorescences are met with simultaneously on the hairy part of the head and face, sometimes on the scapular, the lumbar, and sacral regions, while on the breast and abdomen very few, and on the extremities the least, are seen.

Acne syphilitica is apt to be the *earliest* of all pustular eruptions following an infection, and of all of them runs the *most rapid course.*

It may appear in a subacute or chronic form. In the former, the eruption is preceded for three or four days by febrile movement which increases toward evening. On the places that have been mentioned small granules, varying from the size of a millet-seed to that of a lentil, then form. They are all the more uniformly and extensively disseminated the more quickly the acne appears (acne syphilitica disseminata). In the chronic variety the efflorescences develop gradually in batches, are less numerous, and are collected into groups (acne syphilitica conferta). The latter form may always be regarded as a relapse. The more acute the efflorescences form, the more distinctly and rapidly the purulent transformation at the apex

of the granules will take place. The redness of the granule thereby becomes dull, more brownish in color, and on its apex an acuminated little pustule of the size of a pin's head forms. Part of the contents of this little pustule is absorbed, another part dries, and results in a thin scab. After the desiccation and decrustation of the pustular apex the papular base acquires a glossy appearance, and desquamates several times in succession. On some decrustated acne efflorescences another pustule forms, which, however, is flatter than the preceding one, the entire papule becoming involved, and the pus subsequently dries up and forms a crust. The scales, after falling off, leave a minute depression, barely the size of a pin's head, which in time becomes imperceptible. It often requires three to four weeks, or even a longer period, for a pustule to become dry and form a crust.

However acute the eruption of acne syphilitica may be, it soon assumes the protracted character of all syphilides. New efflorescences crop out from time to time amid those already existing, and if the patient remains untreated the acne-pustules may develop into ecthyma-pustules. Acne syphilitica is likely to resist the most appropriate treatment for six or eight weeks.

It is usually accompanied by erythema syphiliticum maculosum and papulosum, or papular syphilide, while acne syphilitica conferta s. gyrata, occurring as a manifestation of a relapse of the disease, is associated with ecthyma and nodes. Opacities of the mucous membranes (*plaques muqueuses*) in the mouth, on the tonsils, and on the uvula always, and periostitis sometimes, coexist with acne syphilitica.

The prognosis of syphilis in cases of acne-like syphilides is less favorable than in those of erythematous and papular syphilides; its local bearing, however, is in so far still favorable, as no permanent cicatrices remain on the skin. Acne syphilitica disseminata, as a rule, disappears quicker than acne syphilitica conferta or gyrata.

Acne syphilitica disseminata may readily be mistaken for *acne vulgaris* disseminata. These two cutaneous diseases differ from each other in the following respects: In acne syphilitica the pustule is situated only on the top of a papular base; in acne vulgaris, on the contrary, suppuration penetrates down to

the cutis. The vulgar acne efflorescence is a miniature follicular furuncle, from which, by slight pressure, a purulent core may be squeezed out. This is not true of specific acne efflorescences. On acne vulgaris the crusts form sooner, are larger, denser, seem to be wedged into the skin, and adhere firmly to it; the crusts of syphilitic acne are soft and easily removed. The efflorescences of acne vulgaris are surrounded by an intensely red areola, while the papular base of acne syphilitica is sharply outlined, and has a coppery color. Acne vulgaris leaves permanent, oval scars—acne syphilitica small funnel-like depressions, which disappear without leaving any traces. A syphilitic acne efflorescence may become transformed into a desquamating papule—in the vulgar acne eruption this does not occur. Acne vulgaris, as a rule, attacks only the upper parts of the body; acne syphilitica may also be met with on the lower extremities.

(*b*) *Varicella-like Syphilide or Varicella Syphilitica.*

Varicella syphilitica is characterized by a round pustule with a depressed apex, varying in size from that of a lentil to that of a pea; it is surrounded at first by a coppery areola, containing thin purulent matter, which gradually becomes inspissated, so that the eruption resembles variola modificata. The majority of syphilitic varicella pustules are situated in follicles, but some of them also develop on places where no sebaceous glands occur—for instance, the hands and feet. They occur in acquired as also in congenital syphilis. We therefore distinguish varicella syphilitica *adultorum* and *neonatorum*.

Varicella syphilitica adultorum occurs under two forms—namely, varicella syphilitica *disseminata* and varicella syphilitica *confluens*.

Varicella syphilitica disseminata develops occasionally even before the Hunterian chancre has cicatrized; often, however, not till the induration of the chancre has entirely disappeared, having been preceded or accompanied by erythema syphilitica. Round dark-red spots form, and vary in size from that of a lentil to that of a pea. They become converted in twenty-four hours into spherical pustules that are surrounded by a red halo. In about two days the pustule loses its round

form in consequence of the partial absorption of its purulent contents, and becomes flattened and umbilicated. The cover of the pustule sinks lower and lower, and finally is transformed into a thin crust, which after it falls off leaves a dark or bluish-red depression. After the depression on the apex has formed, the pustules sometimes grow larger in circumference, extend over the former areola, and a new one forms around it. The eruption generally lasts six or eight weeks, and even longer. As a rule, there are only a few pustules; most of them are met with in the face, on the forehead, and here and there on the flexor surfaces of the extremities; occasionally on the trunk too. It takes from two to eight months to get well, because new crops of the eruption form from time to time.

Varicella syphilitica confluens adultorum, or pemphigus syphiliticus adultorum of the syphilidologists, is characterized by flat, greenish-yellow, epidermal blebs of the size of a pea, filled with pus, and surrounded by an areola; the blebs gradually coalesce and form a large vesicle. This eruption is so rare that H. Zeissl has seen it only once in thirty thousand syphilitic patients. In this case the vesicles were found on the volar surfaces of both hands, on the dorsal surfaces of some of the fingers, and on both elbows.

Varicella syphilitica adultorum disseminata is most frequently associated with erythema syphiliticum maculosum or papulosum. Impetiginous pustules are apt to occur on the hairy part of the face and head in connection with it. The prognosis of this form of varicella is as unfavorable as that of all the purulent syphilides; still, it is more favorable than that of impetigo, ecthyma, and rupia syphilitica, because it heals without leaving scars. Neither have we seen an instance in which this eruption relapses, which certainly can not be said of the confluent form of syphilitic varicella.

A varicella-like syphilide is most likely to be mistaken for varicella vulgaris. The distinguishing signs are: The eruptive fever of varicella syphilitica never becomes as violent as in ordinary varicella, and subsides as soon as the eruption has appeared, while in the latter it continues. The skin in varicella syphilitica is not only not increased in temperature and is not red, but sometimes it is even pale and chlorotic. The efflo-

rescences, as a rule, are less numerous in syphilitic varicella than in variola modificata, and in the latter the groups of efflorescences do not assume a circular form. The pustules of the syphilide are not as tense, nor do they dry up as quickly, as those of variola modificata, and still less than those of varicella vulgaris. Lastly, the eruption of syphilitic varicella lasts much longer than that of varicella vulgaris or of variola modificata. The pustules of varicella syphilitica are distinguished from the pustules of glanders by being decidedly smaller, surrounded by smaller areolæ, and filled with a clear liquid, while the latter are surrounded by larger and more inflamed zones, and generally filled with bloody pus. Further, the following characteristic features of glanders pustules will serve as additional help in forming a diagnosis: The violent fever, delirium, and sopor of the patient, the bed-sores that soon form, the ichorous discharge from the nasal mucous membrane, and the speedy fatal end.

(*c*) *Impetigo Syphilitica.*

By the term *impetigo syphilitica* is meant a *peri-follicular* exudative process in the skin occurring as a result of syphilis, which quickly brings about a purulent condition of the exudation, whereby the epidermis becomes elevated, and forms irregular, flat, yellowish-green psydrazical pustules.

In the development of impetigo syphilitica a *papular stage*, or *stadium cruditatis*, which lasts only three or four days, and a *stadium suppurationis*, may be distinguished.

The papular stage is characterized by the formation of infiltrated places on the skin, varying in size from that of a lentil to that of a pea. The infiltrated places are irregular in shape, raised slightly above the level of the skin, and violet-red or brownish in color. The softening of the exudation raises up the epidermis on the affected places, and then there originate flat, soft, roundish pustular efflorescences which are surrounded by a violet-red, sharply defined areola. The epidermal cover, however, soon bursts, and a sticky, dirty-yellow matter escapes, which dries up and forms flat or stalactite-like crusts. On violently tearing off the crust, a reddish-black, bleeding spot is laid bare, which soon becomes covered with a new but thinner

scab. Beneath the latter a new epidermis generally forms, and after the scab has fallen off a coppery-red, slightly depressed spot remains, which gradually, though after a long while, becomes smooth and pale. Sometimes, however, there originate upon the ulcer beneath the crust caruncular, wart-like excrescences, resembling mulberry or raspberry growths, which are nothing more than exuberant granulations, the new cells not having undergone either purulent transformation or disintegration, but being converted into spindle-shaped cells and connective-tissue fibrillæ. The French physicians call this form *impetigo à base élevés.* We, however, prefer to retain the name of "*frambosia*," or *myrmekia* syphilitica, as being more appropriate. The warty elevations are gradually absorbed, and afterward the affected places remain bluish-red or coppery for a long time.

Impetigo syphilitica seems to have a predilection for the tender parts of the skin, such as the scalp and beard, the commissures of the lips, the nasal orifices, the grooves of the alæ nasi, the axillæ, and the scrotum; it occurs less frequently on the trunk and extremities. At the angles of the mouth impetigo crusts merge into *plaques muqueuses* on the mucous membrane. The impetigo-spots situated in the beard and on the scalp generally leave behind them alopecia areata. As in all syphilides there are cases of impetigo which appear soon after infection took place in a *disseminated form*, while in others the eruption comes on long after the development of *confluent* groups on circumscribed places. In the confluent variety connected, blackish-brown, thin, and soft crusts form, which adhere very loosely to the surface of the exuding and slightly thickened skin. Gradually, however, the purulent collection under the crusts dries, the latter become more solid, adhere more firmly, the center is depressed, while on the periphery new pustules and crusts form in a serpiginous manner. If such coherent crusts exist for a long time, the softening will penetrate deeper and deeper into the cutis structure, and then there originate in the periphery of the already formed scabs kidney-shaped superficial serpiginous ulcers. After cicatrization has taken place, a bluish-red or coppery-colored superficial scar remains, which desquamates for a long time, and gradually

becomes pale. We have seldom seen this form, and when it occurs it is only found in the vicinity of the genital organs, on the extensor surfaces of the forearm, and of the leg; sometimes, however, on the abdomen and back.

Impetigo syphilitica disseminata generally requires several months for a complete cure; the confluent form a whole year and even longer. With the first form the early syphilides, such as erythema maculatum and papulatum, the desquamating papular, or the varicella syphilitica; with the latter the tardy syphilides, namely, ecthyma or rupia, are associated.

Impetigo syphilitica disseminata is still a tolerably favorable form of syphilide, since, with the exception of a limited amount of alopecia of the head and beard, it leaves no disfigurement; while the confluent forms, but especially those to which serpiginous ulceration has become superadded, admits only of an extremely unfavorable prognosis, in view not only of the local disfiguring cicatrices, but also as an indication of the obstinacy of the disease and the deep inroads it has made into the system. This is evidenced by albuminuria and the cachectic appearance of the patient, and offers a very grave prognosis.

Impetigo syphilitica may be mistaken for *impetigo vulgaris.* It is distinguished from the latter by the fact that the crusts require a longer time to form than in impetigo vulgaris; the syphilitic crust remains soft for a long while, and may be easily raised from the still suppurating base, while the crust of impetigo vulgaris is denser, firmer, and more brittle, and adheres firmly to its base. In impetigo vulgaris the areolæ disappear when the pustule dries, while, in syphilitic impetigo, the areola remains even after the crust is fully developed. Furthermore, the crusts in impetigo vulgaris are surrounded by a margin of whitish scales, which never happens in specific impetigo. Connective tissue, adventitious growths under the crusts are of the rarest occurrence in vulgar impetigo, and when they do occur they are rapidly absorbed, while in impetigo syphilitica elevata adventitious growths are often present, and remain for a long time after the crusts have fallen off, or they may undergo molecular disintegration.

Impetigo syphilitica may be mistaken for *folliculitis bar-*

bæ, menti, labii superiosis, or *sycosis barbæ pustulosa*. Sycosis, however, is a process that penetrates much deeper into the cutis than impetigo syphilitica. Consequently, in sycosis the infiltrated skin of the affected places is very thick; this is not true of impetigo, the process in the latter being located more superficially. In impetigo syphilitica the hairs of the beard fall out very quickly, and none ever grow after recovery (alopecia areata). In sycosis the hairs of the beard do not fall out at all or very late, and if a cure has been effected early they will grow again. Sycosis attacks only the beard, the eyelashes and eyebrows; syphilitic impetigo usually occurs at the same time on the scalp too.

The latter is apt to spread somewhat beyond the growth of the hairs on the forehead, on the cheeks, or on the ears, and there form confluent pustules, greatly resembling the morbid picture produced by *eczema rubrum* or *impetiginosum*. But impetigo syphilitica confluens is distinguished from eczema by the periphery of the latter being pale and indistinct, while the syphilitic impetiginous pustules are very sharply defined. Furthermore, the discharge in eczema is much thinner than in the impetiginous syphilide. Eczema forms an adherent scale, resembling flakes made of a solution of rock-candy, while specific impetigo produces greenish-yellow, soft scabs that may be easily detached from the pustules.

(*d*) *Ecthyma Syphiliticum.*

Ecthyma syphiliticum is characterized by pustules varying in size from that of a lentil to that of a bean, situated upon inflamed, infiltrated bases, surrounded by red zones, and generally contain sanious or bloody pus.

Ecthyma pustules either occur in scattered uniform efflorescences or a group of smaller spots is found around a large one on some part. They may form on any part of the body, but are most frequently met with on the scalp and legs.

The ecthyma pustule may develop in a twofold manner. An injected place, of a violet color, and varying in size from that of a lentil to that of a bean, forms, and then upon this, in twenty-four to forty-eight hours, a pustule develops, at the periphery of which the skin soon becomes infiltrated (*ecthy-*

ma superficialis). Or the primary congestion increases, exudation takes place, and from it a pustule results (*ecthyma profundum*).

At first the pustules contain a thin, serous fluid, which, however, soon becomes thicker and purulent. In most cases the pus is mixed with some blood. The longer the pustule grows the redder it becomes, and the more the area is infiltrated. The cover of the pustule is seen to be soft and flabby, like that of other syphilitic pustular eruptions. After a few days the central part of the pustule collapses, becomes dry, and a rusty-colored or blackish-brown crust forms, which, owing to the continuation of the suppuration beneath it, keeps on growing thicker, and, at least at first, is easily detached. Underneath the crust an ulcer is found, varying in extent according to the intensity of the infiltration. The ulcer is surrounded by a steep border, and the cavity is filled with a grayish tenacious mass of molecular détritus, which erodes adjacent tissues, and not only fosters the deep destruction of the cutis, but also its peripheral disintegration.

In ecthyma profundum the crust is always thicker, and the ulcer of the cutis is likewise scooped out more. Sometimes it extends beyond the margins of the ulcer, and then again it may leave the cavity partially uncovered; and thus it seems to be surrounded by a soft, purulent furrow. The center of the crust, being the oldest point of the pustule, is depressed if the ulceration extends in circumference.

As soon as the inflammatory process subsides at the periphery of the ulcer, granulations begin to form at the bottom, the crust becomes denser and adheres more firmly, but sooner or later falls off. This leaves a depressed, dark-red scar, which is apt to desquamate a long time, but gradually becomes pale, even paler than the surrounding normal skin. In superficial ecthyma, after the crust has fallen off, the cutis is found infiltrated in the form of a papular elevation, whose surface, however, readily becomes eroded and ulcerated.

The course of the eruption, notwithstanding its acute beginning, is very tardy. This is shown on the different spots by the fact that the red areolæ surrounding them gradually become dark-brown or coppery.

A period of six months or more generally elapses from the time the infection occurred till an eruption of ecthyma appears. An outbreak of this syphilide is usually ushered in with severe febrile movement; and if ecthyma profundum lasts for a long while, remittent febrile symptoms of a hectic character supervene (febris hectica syphilitica).

Ecthyma syphiliticum occurs in connection with erythema maculosum and papulosum, with desquamating papules, as well as with other pustular syphilides, especially acne and impetigo syphilitica. Onychia, falling out of the hair, mucous patches, ulcers on the tonsils and in the fauces, and iritis, not infrequently are associated with this exanthema. In men we have often seen syphilitic orchitis accompany specific ecthyma.

The pustules may remain for weeks without undergoing desiccation. We have seen some pustules of syphilitic ecthyma persist for more than a year, and relapse, notwithstanding the most judicious treatment.

The prognosis, both general and local, of this eruption, is more grave than that of any of the syphilides already described. Ecthyma leaves disfiguring cicatrices. Relapses occur frequently. There is a remarkable tendency to suppuration of the complicating inflammations in all the organs and tissues of the body.

This eruption is most likely to be mistaken for *ecthyma vulgare cachecticum luridum;* but ecthyma vulgare is more like furunculosis, or like the boils occurring in ecthyma nodosum or contusiforme. It is more painful, the areolæ surrounding the sores shade off gradually, and have more of a bluish than coppery color, with a greenish tint on the periphery. Furthermore, in ecthyma vulgare there is less tendency to purulent degeneration, and the suppuration is more superficial. The furuncular eruptions become soft, rupture, and a quantity of sanious fluid escapes. Ecthyma vulgare luridum usually occurs *only* on the legs, especially in the most wretchedly intemperate or scorbutic persons.

(*e*) *Rupia Syphilitica.*

By the term *rupia syphilitica*, syphilitic filth-tetter (ῥυπός—sordes), is meant an uneven, dirty, rusty-brown-colored crust,

situated upon an ulcer that penetrates more or less into the cutis, hemmed in by a pustular wall, and surrounded by a livid, inflammatory zone.

The eruption appears at about the same time as ecthyma, and is always attended by febrile phenomena. The elementary skin-disease of rupia syphilitica consists of livid papular inflammatory foci, varying in size from a pea to that of a bean, which are transformed within twenty-four or forty-eight hours into flabby blebs, filled with a dirty-colored or bloody matter. The center of these blebs sinks in, and in two or three days they dry up entirely. The blebs grow in circumference by new pustules forming on their outskirts in circles, surrounded by areolæ, which in turn dry up. In this manner a rupia crust may attain a diameter of two to four centimetres. The crust is uneven, thickest in the center, becomes flatter at the edges, thereby acquiring the form of an oyster-shell.

If the crust is forcibly pulled off, there is found underneath a filthy-looking, dusky, flabby ulcer, having steep, undermined, livid margins, which secrete a sanious ichor.

A rupia ulcer heals in the same manner as an ecthyma sore. Not infrequently, however, it happens that only a segment of the rupia ulcer heals by cicatrization, while the ulceration goes on in the opposite direction, and a crescentric or kidney-shaped ulcer is the result.

Rupia pustules occur either in large numbers of the size of a bean, or very sparsely, and then they are as large as a dollar. The smaller form may cover the trunk and extremities in thick groups, while the larger will be represented by three or four crusts only, which are usually situated on the extensor surfaces of the limbs.

The average duration of a rupia pustule is two to three months.

The attending phenomena of specific rupia are like those accompanying ecthyma syphilitica; but, in addition, we have in the former a more frequent occurrence of caries, and still more of ulcers of the fauces. Furthermore, the terribly vitiated condition of the system is always associated with albuminuria, hæmaturia, and scorbutic lesions. In consequence of these complications, the prognosis is even more unfavorable

than in syphilitic ecthyma. Of the patients who succumb to syphilis, the great majority suffer from rupia.

According to our experience, specific rupia originates only in consequence of acquired syphilis. We have never seen an instance of this eruption in children suffering from congenital syphilis.

4. Nodular Syphilide of the Skin; Tubera Syphilitica; Tubercula Syphilitica; Syphilitic Nodes of the Cutis and of the Subcutaneous Cellular Tissue (Gummata); Syphiloma, according to Wagner.

Syphilitic nodes are due to a morbid proliferation in the cutis or subcutaneous cellular tissue, in consequence of which globular tumors form on the surface of the skin. Hence, we may distinguish deep and superficial syphilitic cutaneous nodes. The superficial ones are small—about as big as a pea; the deep nodes are as big as beans, or even hazel-nuts; consequently, the superficial nodular syphilide may also be called the *small*, and the deep the *large*, nodular syphilide.

Superficial syphilitic nodes originate either from a mesh of the corium, or from one or several adjacent cutaneous follicles, and develop in the same manner as a furuncle, but with less pain, and also much more slowly. When the inflammatory foci have attained the size of a lentil, the surface of the affected places of the skin becomes engorged, and the patients experience pain, which is aggravated on pressure. If the cutaneous kernel continues to develop, a dusky-colored spot, as big as a pea, appears, gradually grows, and forms a dark-red globular node.

The deep syphilitic nodes start in the subcutaneous cellular tissue, where small movable kernels, as big as bird-shot, form. On external pressure they are somewhat painful. As the nodule continues to grow, the overlying skin acquires a red color and becomes adherent to it, and in connection with it forms a tumor. After many months or years this attains the size of a bean or of a hazel-nut.

The small nodular syphilide attains its usual size in a short time. In some cases only small nodes—i. e., *cutaneous nodes*—originate throughout; in others only large ones—i. e., *subcutaneous nodes;* in most cases, however, cutaneous nodes

will be found on one part of the body, and subcutaneous ones on another part.

The developed syphilitic node is generally globular, sometimes conical or acuminated, not infrequently it is flattened. In color and consistency the node varies according to its age and phase of development. The recent but fully developed node has a brownish-red or coppery color, is flat, glossy, and hard. The older the nodes are, and the nearer they approach the regressive stage of metamorphosis, the paler they become. When absorption sets in they turn brown, and, after they are entirely absorbed, grayish discolored spots will remain for a while. If a node is about to undergo ulceration it turns livid, soft, and doughy, and sometimes fluctuation may be detected in it.

In its histological development the cutaneous node resembles very much the syphilitic connective-tissue nodes or *gumma.* According to Wagner's researches, the syphilitic node, which he regards as a *new growth,* presents itself, when recent, as a grayish, soft, homogeneous, dry mass, yielding a slight amount of slimy, clear, or murky juice. The neoplasm forms either a nodular mass, varying in size, round or irregular, sometimes sharply defined, or it is a diffused infiltration of varying dimensions; or, lastly, nodular masses appear in a diffuse infiltration. The most important elements of this neoplastic growth are cells and granules, such as we find in a Hunterian indurated primary lesion and in other syphilitic inflammatory processes. They lie, partly singly, partly in numbers, in cavities formed by connective tissue, but which are by no means characteristic of this lesion. The older the node is, the less numerous are the cellular elements, and the more extensive is the connective tissue. After existing for a variable period the node either becomes very dry or it undergoes ulceration, or both morbid changes go on together. Simple and fatty atrophy of the cells and granules is the most frequent metamorphosis. The central and oldest part of the neoplasm undergoes metamorphosis first and thence it spreads to the circumference.

According to Virchow, a syphilitic node most closely resembles recent granulation-tissue, and the process that takes

place in it differs from the usual ulceration and suppuration only in so far that no healthy or good pus forms, but only a tenacious (gummous), slimy, disorganized substance. Owing to this glutinous, synovial-like substance, the syphilitic nodules received the name of gummata. Wagner suggests the term "syphiloma."

The external form of a specific node changes according to the manner in which the retrogressive metamorphosis is inaugurated.

If the nodes are about to be absorbed by fatty degeneration they first become pale and flat, and the cutis covering them begins to shrink. After having desquamated repeatedly, they entirely disappear, leaving a slightly depressed spot—i. e., a circumscribed atrophy of the skin. The depressed spot remains bluish-red for a long while; finally, the pigment disappears and the scar becomes peculiarly whitish. Nodes are absorbed only under the most favorable circumstances in robust, healthy persons. Under less favorable conditions, in constitutions that have become debilitated, central softening usually ensues. This will manifest itself in a different manner, according as the nodes are of the cutaneous or subcutaneous variety.

If the node that undergoes disintegration is of the cutaneous species, a small quantity of serous fluid will be poured out under the glossy epidermis covering it, which gradually solidifies, and, with the cutis that has been detached from the subjacent tissue, forms a crust. By this process the former globular form of the node becomes flattened. If the crust is now removed, the surface of the exposed node is seen to be even more glossy than before, and more serous fluid of the kind already mentioned exudes from it. This again dries and forms another thin crust, beneath which suppuration of the node goes on, finally resulting in an ulcer that penetrates into the cutis, corresponding in size to the former node. So long as the disorganization of the node continues, the crust will be soft and easy to detach. Gradually, however, the base of the ulcer begins to granulate, the crust becomes firmer, more adherent, but finally falls off, leaving a depressed, dark-brown scar.

If the node that undergoes central molecular disorganiza-

tion is of the subcutaneous variety, the skin covering it—and which, in conjunction with it, forms a tumor—becomes red. An inflamed swelling, more or less extensive according as it is composed of one or several conglomerated nodes, originates. The tumor, which at first is solid, gradually becomes doughy, and begins to fluctuate on palpation. The affected part of the skin finally becomes livid, attenuated, and bursts in one or more places, according as the tumor consists of one node or of an agglomeration of several, and a thin, purulent fluid then escapes. If the tumor was composed of one node only, the opening will rapidly become larger, and an ulcer that penetrates to the very bottom of the former node will form. Its edges are steep, undermined, and its bottom is covered with dirty-looking matter. No zone or inflammatory areola is usually to be seen around the ulcer. If there are several openings, the bridges of the skin between them gradually slough away, and a large ulcer forms, which is surrounded by a livid-red, undermined, cutaneous margin. The pus from the ulcer dries up, and forms a large or small, thin or thick, greenish-yellow or reddish-brown soft crust, which lies quite loosely upon the bottom of the cavity. While the crust of a superficial node that has undergone degeneration is somewhat larger than the node itself, in the deep variety, it is often smaller than the ulcer, lies beneath the skin, and is surrounded by a circular groove that separates it from the sharply outlined margins of the latter. If granulations begin to sprout on the bottom of the ulcer, the crust becomes denser, and adheres more firmly. The ulcer seldom closes up by concentric contraction of the skin alone; cicatricial tissue is almost always formed, and fills up the cavity.

Ulcers which have formed in consequence of the disorganization of the cutaneous and subcutaneous nodes may retain their round form till cicatrization has ensued. It very frequently happens, however, that a round spot on the margin of the ulcer cicatrizes in one direction, while sloughing goes on concentrically in another, and cicatrization gradually creeps on over the newly ulcerated space. Thus kidney-shaped, serpiginous ulcers may originate from circular sloughs. This serpiginous ulcer usually lasts a long time, and sometimes spreads

over a large surface. But kidney-shaped ulcers may be produced by the disorganization of cutaneous and subcutaneous nodes without having a serpiginous character. This is the case when the nodes are aggregated in a semicircle, and then undergo purulent degeneration.

After the skin formerly occupied by the node has completely cicatrized, it becomes attenuated, depressed, has a bluish-red or coppery color, feels hard to the touch, and desquamates. The cicatrix only becomes pale and soft when the proper treatment has been continued for a long time. It then ceases to desquamate, and its remarkably white color presents a striking contrast to the surrounding normal integument (atrophy of the discolored spot). The uppermost stratum of the cicatrix, which takes the place of the epidermal layer of the normal skin, has the appearance of straw-paper, and becomes wrinkled, as if it were too large for the cicatrix. In some cases, the gumma-cicatrices are not depressed, but, on the contrary, project even above the level of the skin. These scars have a keloid appearance, and, according to our experience, soon degenerate. In fact, only those scars resulting from ulceration of syphilitic nodes are likely to be permanent that have ceased to desquamate, are perfectly white, and not abnormally hard.

Syphilitic nodes may appear on any part of the skin, but are usually met with in the face, especially on the forehead, the tip of the nose, and the lips. On the trunk, they seem to have a predilection for the region of the shoulders. They are very frequently found in the immediate vicinity of a joint, as also on the extensor surfaces of the extremities; further, at the sterno-clavicular and claviculo-acromial joints. On the leg, they develop generally on the anterior and internal surfaces. Occasionally we have even seen them on the palm of the hand and on the ear. This syphilide is generally confined to one or several of the places mentioned, and occurs in groups of two or three simultaneously. It is seldom seen scattered uniformly over the body, and even then the nodes do not appear on all the places at once. When occurring in groups, the nodes form oval, curved, or circular segments, which develop in the following manner: A single node, remarkable for its size, or several nodes near each other, originate at a certain place on the

skin, and, as these begin to disappear, partly by absorption, partly by desquamation, new ones shoot up on their outskirts. The latter again may disappear in the same manner as the preceding crop, and be succeeded by another, resulting in circles, of large or small dimensions. The nodules that form a circle are grouped more or less closely, or they coalesce so that the globular conformation of the individual tumors is no longer distinguishable. In some cases the nodules, especially those occurring in the face, are apt to be huddled together so closely that, collectively, they form a conglomeration like a cluster of grapes (*syphilis racemiformis* of the old writers). The origin of tumors resulting from the coalition of several nodules, on whose surfaces, however, the contours of the individual gummata are undistinguished, has been designated by some authors as *lupus hypertrophicus syphiliticus*. Like the dry nodes, the suppurating nodules also occur in groups, and are arranged in circles. Disintegrating gummata, which are so closely clustered together that they almost form *one* node, have been called by some *lupus syphiliticus exulcerativus*. That form in which the nodes, arranged in a semicircle, suppurate in a given direction only, while cicatrization goes on toward the center, and new softening gummata constantly spring up at the periphery, has been termed *lupus serpiginosus*. The term *lupus* ought to be reserved for lupus vulgaris, and the suppuration of syphilitic nodes alone should be spoken of in describing the disease under consideration.

Of all the syphilides, nodular syphilide runs the slowest course, and is the most obstinate to treat. Not only do new gummata spring up on various parts of the body, despite treatment with mercury and iodine, but they also form on those places where some of them had already existed and disappeared. The earliest period in which we saw syphilitic nodes appear was four months after infection had taken place; the latest period twenty years. Other syphilographers mention even thirty and forty years. Of all the syphilitic diseases of the skin which came under our observation, specific gummata were the least frequent.

Being the result of a later phase of the syphilitic disease, nodular syphilide never appears in conjunction with those phe-

nomena that are peculiar to the earlier manifestations. At the most, a few ecthyma-pustules or rupia-ulcers may be found associated with it. The presence of moist papules may be excluded *a priori* with the utmost safety. The most frequent complications of the tubercular syphilide are orchitis syphilitica, extensive disease of the fibrous structures, ulcerations and malformations of the nasal and pharyngeal walls, syphilitic disease of the liver and of the brain.

Syphilitic nodes or gummata always indicate a far-advanced syphilitic affection, and at the same time they are the final results of the morbid processes. They not only occur on the skin and mucous membrane, but in other tissues and organs of the body. A specific cutaneous node is, therefore, an index for the diagnosis of syphilitic diseases of the viscera, brain, and nerves. Hence it is also clear how a nodular syphilide may essentially alter the prognosis. It may also be added that the disease may relapse after many years of quiescence and apparent cure. When syphilitic cutaneous nodes undergo degeneration, the suppuration of coexisting inflammatory products —for instance, in the periosteum, and, in consequence thereof, caries and necrosis of the affected portions of the bones—may be apprehended. Furthermore, ulcerating nodes may cause terrible mutilation and disfigurement with frightful rapidity. Thus, one ala naris, a part of an eyelid, or a lip, may be destroyed. In like manner, the scars which result from the ulceration of the syphilitic node constitute unmistakable evidence of the character of the disease that preceded them.

Of the specific diseases of the skin, *lenticular papular syphilide* alone can be mistaken for the nodular syphilide—an error that is of no importance as regards the treatment, but altogether different as regards prognosis. The smaller size of the papule, the site, the total absence of pain, the much earlier appearance of this eruption and its profuseness, the simultaneous presence of moist papules on the skin and on the mucous membrane, as also its entire course, will be more than sufficient to guide the physician in differentiating the two cutaneous diseases that were engendered by the same morbid condition of the blood.

Of the non-syphilitic diseases of the skin, molluscum sebaceum and fibrosum, acne rosacea tuberosa, rhino-scleroma, lupus vulgaris, and especially carcinoma of the cutis, are the only ones that can be mistaken for nodular syphilide.

The *molluscum* differs from specific gummata by the constriction at its base, as it is more or less pediculated in most cases; but even the non-pediculated molluscum sessile affords, by the plate-like depression at its highest point, by its softness, and by the inspissated sebaceous secretion, which may be squeezed out on puncture, sufficient data to prevent an error in diagnosis. Molluscum fibrosum is recognized by its firmness and painlessness, and also by its persistence.

The kernels of *acne rosacea tuberosa* differ from syphilitic nodes of the face and nose by the fact that they are not as smooth and glossy as the latter, being almost always uneven. Furthermore, there is a total absence of the dilatations of the capillary vessels in the vicinity of the syphilitic node, and its brownish color is distinctly outlined, while the dark-red color of acne rosacea merges gradually into the normal carnation of the skin. The skin adjacent to the specific node is not so hypertrophied as in acne rosacea of severe grade. Lastly, syphilitic gummata frequently undergo degeneration, and in this manner often destroy part of the nose. This never happens in acne rosacea.

The greatest difficulty in reference to the differential diagnosis will be occasioned by the neoplastic growth which Hebra has called *rhino-scleroma*, because, like the nodular syphilide, it has the tendency to destroy the soft parts of the nose and of the uvula; and, moreover, also runs a protracted course. The absence of the phenomena preceding and accompanying syphilis; the stony hardness; the diminished permeability of the nasal passages; the slow destruction of the soft parts of the nose, while the bony structure remains intact; the inefficiency of antisyphilitic remedies; finally, the history of the disease, preceded by a trauma of the nose—will enable us to exclude syphilis, and suspect that the neoplasm is a rhino-scleroma.

The following pathogenetic and morphological signs may be pointed out for the purpose of distinguishing *lupus vul-*

garis from confluent and sloughing nodular syphilide: Lupus vulgaris develops generally before the occurrence of puberty, while specific gummata are usually met with in persons of more advanced years. The destruction of syphilitic nodes goes on more rapidly than that of lupus tubercles. Lupus-spots are always surrounded by an active zone, which gradually fades into the normal skin, and not infrequently forms a phlegmonous swelling. Specific confluent nodes and ulcers resulting from their disintegration have very little or no inflammatory areola around them. The tubercles and ulcers of lupus vulgaris are painless when touched, while marked pressure on syphilitic gummata causes severe pain. Lupus vulgaris, as a rule, does not attack the bony part of the nose, while gummata of the nose generally begin with ozæna syphilitica. Lupus vulgaris usually heals by leaving radiating scars; syphilitic nodes leave depressed scars. It is often difficult to decide whether, in a given case, we have to deal with lupus vulgaris or hereditary lues; but the course and the effects of the remedies, and still more the fact that in the latter affection the soft palate, as a rule, is ulcerated or adherent to the posterior pharyngeal wall, will often furnish a key to the diagnosis.

Multiple carcinoma of the *skin* and *sarcoma melanodes* present great similarity to nodular syphilide, which, like them, is scattered over the integument. However, carcinoma and sarcoma tumors never have the spherical form of gummata; they are flat and smooth. They usually occur in large numbers on the trunk; a few solitary tumors only may be met with in the face and on the extremities. In color they are bluish or brownish-red, whereby the skin acquires a marbled appearance. Of course, no carcinomatous or sarcomatous tumors disappear by absorption; and equally rare is it for a carcinomatous tumor to ulcerate speedily; for long before this takes place cancerous growths will have formed in some of the viscera of the body, undermined the system and produced death. At the autopsy multiple carcinomatous tumors are found in the form of small medullary cancers, white, or entirely black in color (cancer melanodes), or only sprinkled with black spots; sarcoma melanodes appears as an incomplete fibromatous neoplasm, profusely tinted with dark dots.

The So-called Pigment Syphilis.

Syphilitic efflorescences, especially gummata, pustular syphilide, and the primary lesion, usually leave intensely discolored spots, which last for a long time. These discolorations disappear when the syphilis is entirely cured, and are sometimes succeeded by a permanent blanching of that part of the skin previously occupied by the specific ulcer. We know of no syphilide that manifests itself only by the appearance of primary discolorations of the skin.

Syphilitic Affections of the Hair.

Syphilis, like some of the acute febrile affections, often causes diseases of the hair, and the persons attacked by it become bald—sometimes temporarily, in other cases, permanently. The hairs that are about to fall out lose their luster, and the patient, on combing or brushing himself, or by running his fingers through the hair, causes many of them to fall out. Thus, the capillary covering of the head becomes diminished, and the scalp is more or less exposed. Marked baldness of the head becomes evident when the defluvium capillorum has continued for a long while. Various forms of baldness are distinguished according to the location, extent, and severity of the loss of hair. Thus, when the hairs begin to fall from the crown of the head, it is called phalacrosis; from the back of the head, opistophalacrosis; unilateral baldness, hemiphalacrosis; and if the falling out of the hairs occur in serpentine lines, ophiasis. As a result of syphilis, not only the hairs of the head fall out, but also the eyelashes, eyebrows, the beard, the hair of the pubis, and axilla. The morbid process that causes the falling out of the hair is due, according to our researches, to the shrinking of the cells and granules that constitute the hair-pulp. The hair in the follicle, therefore, dies, and would fall out, were it not retained in its sheath at the root. Finally, however, the root-sheath, too, is cast off in the form of minute scales, the hair loses its hold and drops out, or it falls out with its root-sheath.

The falling out of the hair, as a rule, begins a few days after the eruptive fever has been ushered in, and it is not only ar-

rested by curing the underlying disease, but the hairs speedily grow again. If the treatment has been inappropriate, the defluvium capillorum may recur several times; the plentiful growth of the hair after each falling out may, in fact, be looked upon as a favorable prognostic omen. Sex, age, and season of the year exercise no modifying influence over the origin of alopecia syphilitica; but the growth of the hairs is so far affected by age, that in young persons it takes place more quickly, and is more complete, than in those of advanced years. The falling out of the hairs usually precedes and accompanies early syphilides.

Syphilis, however, sometimes causes a circumscribed baldness (*alopecia areata*) by suppuration and destruction of the hair-follicles. This happens, especially, in consequence of confluent, impetiginous syphilides or deep ulcers of the scalp, in the beard, or on other places. No hairs can grow upon cicatrices that form here.

In order to distinguish alopecia syphilitica from *alopecia vulgaris præmatura* and *senilis*, it is necessary, in addition to the antecedents and concomitants, to take into consideration the facts that in the latter affection the hairs only fall out on the crown and anterior part of the head, while those on the rest of the scalp remain; that in calvities senilis or præmatura the skin is remarkable for its luster and smoothness, because in these diseases the hair and sebaceous follicles disappear entirely; in alopecia syphilitica, on the contrary, they are not only not destroyed, but even generate an increased amount of sebum. The deposit of sebum upon the smooth and bald skin gives it a scaly appearance.

Alopecia produced by *herpes tondens* (*phyto-alopecia*, according to Gruby) may readily be mistaken for the circumscribed alopecia resulting from the suppuration of syphilitic efflorescences. The former disease of the hair, however, is distinguished by the fragility of the hairs, and, above all, by the presence of a cryptogamous parasite.

Syphilitic Disease of the Nails.

The nails, like the hair, to which they are histologically akin, suffer from syphilitic morbid alterations, which manifest

themselves in an inflammatory affection and ulceration of the skin in immediate contact with the nails. The latter are secondarily destroyed, and cast off—*paronychia syphilitica*—or the texture of the nail undergoes certain alterations without the parts around it becoming in any way affected—*onychia syphilitica.*

(*a*) Paronychia syphilitica appears either as an inflammation of the nail-groove—*paronychia syphilitica lunularis*—or as an inflammation of the fissures of the nail—*paronychia syphilitica lateralis.*

Paronychia lunularis begins with a moderate degree of swelling and redness of the cutaneous structure bordering on the root and lunula of the nail. The swelling gradually increases, has a dull, reddish color, is semilunar in shape and painful to the touch, and covers the lunula more or less. In some cases this swelling becomes pale and subsequently undergoes resolution. In most cases, however, the epidermal covering of the swelling under consideration is raised up by a sero-purulent or sanious fluid, resulting in a sloughing wall which surrounds the root of the nail. After the slough has been cast off, an ulcer will be found which may destroy the matrix of the nail, and then gradually extend to the lateral fissures, being, in fact, a continuation of the morbid process of the root of the nail. When the slough forms, the nail loses its transparency, becomes greenish, and finally rough and brittle. The more the ulcer encroaches upon the bed of the nail, the more the nail will be raised up from its bed; and, finally, it is cast off, or is gradually macerated by the secretion of the ulcer and dissolved. In most cases a new nail grows after the old one has fallen off; but it is quite sure to be crooked and ungainly. The inflammatory process that brings about the destruction of the matrix and the bed of the nail, constitutes, according to our researches, a locally modified ecthyma pustule. We have seen, in fact, in most cases of severe pustular syphilides, ulcerating paronychia, while in the dry syphilides paronychia usually disappears by absorption.

Paronychia lateralis accompanies papular syphilides. In one of the lateral fissures of the nail, a moist papule forms, slowly extends under it, and, by increasing in size, gradually

raises, and, at the same time, enucleates it. Having been disturbed from its position, the nail soon displays the textural lesions already described. If the papule under the nail undergoes molecular destruction, the latter will gradually become soft, and then be cast off.

Paronychia syphilitica may develop upon the fingers; but it occurs by preference on the toes. At any rate, the pressure of the shoe seems to foster its production. As a rule, it is met with only on one finger or one toe.

(*b*) Onychia syphilitica displays various grades. In the lowest grade the diseased nail has a rosy color, its gloss is gone, and small white spots, as big as a pin's head (*flores* or *mendacia unguium* or *lies* of the English writers) originate upon it. They are due to the imperfect hardening of the cells that form the substance of the nail (Valentine), and irritation of the matrix seems to be at the bottom of it. If the general syphilitic disease is treated early and successfully, the nails will subsequently have no white spots. The succeeding healthy portions are then separated from the diseased portion by a white line; but if the specific disease continues, the nail becomes more and more opaque, rough, and brittle, and distorted on its free margin, where small fragments may be broken off. At the same time its root is gradually detached from the matrix, and is succeeded by a nail that is likewise diseased.

The affection of the tissue under consideration, which, in contradistinction to paronychia suppurativa, we would call *onychia sicca*, develops mostly in cases of pronounced and persistent psoriasis palmaris et plantaris diffusa syphilitica. It generally attacks all the nails of the fingers as well as of the toes.

We will only speak here of the various non-syphilitic affections of the nail which might be mistaken for the specific variety, and, not being able to point out any distinguishing pathognomic signs, we are compelled to refer the reader to the fact that the etiological factor of any disease of the nail can only be ascertained by the previous and present history.

The non-syphilitic diseases of the nail are either of local nature, or originate in consequence of a general disease. Thus, paronychia ushered in by suppuration of the nail-fissures, especially on the big toes, often originates from pressure of a

badly fitting shoe that causes crowding of the lateral margin of the nail into the flesh. In consequence of *eczema* of the nails of the fingers and of the toes, a paronychia ending in loss of the nail likewise is sometimes produced. Scrofula, also, not infrequently causes an inflammatory bulbous hypertrophy of the nails; still, in this case suppuration of the hypertrophied part seldom ensues. Further, it is said that in persons who suffer from valvular disease of the heart an onychia sicca occurs (Wunderlich), which is known to authors under the name of *defoedatio*, or *scabrities unguium*, and is distinguished by the fact that the nail not only becomes rough, opaque, and brittle, but undergoes hypertrophy, especially on the free margin, and acquires a color similar to the mold on cheese (cheesy nail).

Syphilitic Affections of the Mucous Membranes.

Next to the common integument, syphilis avails itself of the mucous membranes upon which to locate its morbid lesions. It manifests itself upon these structures under three varieties, namely:

(1) Diffused erythema.
(2) Papular inflammatory foci.
(3) Gummous, ulcerating nodes.

Pustular efflorescences in consequence of syphilis never occur upon mucous membrane.

(1) Syphilitic Erythema of the Mucous Membrane; Syphilitic Catarrhal Inflammation; Erythema Syphiliticum Membranæ Mucosæ.

Syphilitic erythematous affection of the mucous membrane is seen in the form of a diffused, sharply defined, peculiarly livid color over extensive portions of the mucous membrane. It may disappear without causing the least textural lesion, and subsequently return; but it may also produce such lesions as will leave the epithelium upon the affected places opaque, or they are cast off here and there, resulting in small erosions.

While in some places syphilitic erythema will produce a sensation of dryness of the mucous membrane (erythema of the palate and of the posterior wall of the fauces), on other places it supervenes with anomalies of secretion of the affected

part. The disease always begins with a diminished degree of secretion of the mucous membrane and the sensation of dryness, but in the course of the malady so much mucus is secreted that it amounts to a real blennorrhagia; or even actual follicular suppuration, syphilitic catarrh, or snuffles, syphilitic vaginal and preputial gonorrhœa, and follicular ulceration of the tonsils, may ensue. The swelling of the syphilitic, erythematous mucous membrane generally is slight, being very marked on certain places only (uvula, tonsils, labia minora). In consequence of the swelling, certain tubular tracts of mucous membrane—for instance, the lachrymal duct, nasal and ear passages, and the larynx—may become narrowed, producing serious functional disturbances in the conduction of sound and of the tears, as also in speaking.

The specific catarrhal affection of the mucous membrane generally is a symptom of one of the first phases of syphilis, and is therefore always accompanied by early morbid phenomena in other tissues and organs. It occurs either as a solitary manifestation of syphilis, or it is only the forerunner of papules of the mucous membrane which are in course of formation or nodular exudations, or it appears in company with the latter only, and remains as their sequelæ. Certain external and internal conditions promote syphilitic catarrhal affection of some regions. Thus persons who smoke or chew tobacco to excess, those who are exposed to unfavorable conditions of the weather, or who often suffer from angina catarrhalis vulgaris, and tuberculous patients, are more frequently attacked by angina catarrhosa syphilitica than others. Catarrh of the vulva seems to be fostered by frequent intercourse; congenital phimosis favors the production of balanitis, etc.

Syphilitic erythematous affection may relapse like other specific affections; syphilitic catarrhal affection of the isthmus faucium, in fact, relapses most frequently. As a rule, when a catarrhal affection relapses, papular inflammatory foci will again form on the same places.

(2) Syphilitic Papules on the Mucous Membrane.

The mucous membrane papule does not always, nor on all places, possess the nodular shape of its sister-efflorescences on

the common integument. As a rule, it barely rises above the level of the mucous membrane. But those papules that are situated upon places of the mucous membrane where the papillæ are markedly developed—for instance, on the cup-shaped follicles of the sense of taste at the root of the tongue—have a good opportunity to develop into the papular type of the disease. Like the syphilitic papule of the common integument, the specific papule of the mucous membrane is caused by cellular infiltration of the papillæ, or into and around the follicles of the mucous membranes.

A mucous-membrane papule develops in the following manner: A circular spot on the mucous membrane as big as a lentil or pea becomes red and rises somewhat above the level of the membrane, from which, in case the mucous membrane is not catarrhally reddened, it will be distinguished by its livid color. Early and appropriate treatment may cause complete absorption of papules that are developing. But, if left untreated, and if the pernicious effects that tend to promote their development continue to exercise their influences upon the diseased mucous membrane, the epithelial layer will become opaque, acquire a milky whiteness, or the color of mother-of-pearl (*plaques opalines* of the French writers). These opaque spots on the mucous membrane look as if the latter had been penciled with a solution of nitrate of silver. The pearly-white epithelial layer on the mucous-membrane papule may be cast off, in which case the efflorescence, deprived of its epithelial cells, will resemble an intensely red erosion that bleeds readily. If several papules denuded of their epithelium-cells are situated closely together on some place of the mucous membrane, the latter will become dotted with red spots, as is often the case on the upper surface of the tongue. Even in this stage, the papular efflorescence may disappear entirely, or undergo still further alterations. These papules, like those of the common integument, may, in rare cases, by the sprouting of the papillæ, grow into conical, condylomatous products, having an irregular caruncular appearance—a condition that is frequently met with on the uvula and under surface of the tongue. Most frequently it undergoes molecular degeneration, resulting in whitish-gray patches, with rough, shaggy borders (syphilitic

aphthæ of the old writers). If the mucous-membrane papules that have undergone molecular degeneration are situated closely together, or if they coalesce, the affected spot will acquire a diphtheritic appearance. If a part of a papule covered with molecular détritus is situated upon the mucous membrane, and the other part on the common skin (moist papule), the détritus upon the latter will dry up and form a dirty, brownish-colored crust, while that upon the mucous membrane will remain in a pultaceous condition. Such biformed papules are frequently found at the angles of the mouth, on the margins of the labia majora, at the anus, etc. The longer the destructive process in the papule lasts, and the longer the injurious external causes continue to exercise their evil effects, the deeper the sloughing will extend; and round, straight, or S-shaped fissures of the mucous membrane (*rhagades*) will originate. They are situated upon a hard base, and sometimes surrounded by a red wall. These clefts of the mucous membrane are frequently found on the borders of the tongue, especially when they are constantly irritated by rough fragments of teeth, and in patients addicted to the use of tobacco; at the anus in consequence of difficult defecation. They are, however, also met with on the upper surface of the tongue in inveterate relapsing syphilis.

The papules are observed most frequently on the mucous membrane of the mouth, uvula, fauces, and the tracts leading from these parts. They originate here mostly on the mucous membrane of the tonsils and of the lips, especially at the angles of the mouth, on the uvula, and in the sinus between the anterior and posterior pillars of the palate; next in order of frequency, on the lip, edges, and roots of the tongue; then, on the mucous membrane of the cheeks, particularly near the angles of the mouth. Sometimes they develop on the vocal cords, and in the sinus Morgagni of the larynx; rarely on the posterior pharyngeal wall and in the Eustachian tube. They occur less frequently on the mucous membrane of the vagina, on the cervix and os uteri, at the meatus and rectal mucous membrane of both sexes, on the internal surface of the prepuce in the male, and, lastly, on the mucosa of the nasal passages, especially of the nares and of the cartilaginous portion

of the septum. Mucous-membrane papules occur either isolated or in groups.

Although they are ushered in with acute inflammatory phenomena, such as pain and erythematous redness of the skin in the vicinity, still they soon assume a protracted course, obstinately resisting the most judicious local and general treatment for months; or they occasionally disappear, but soon return again. As soon as resolution sets in, the opacity and thickening of the epithelial covering begin to disappear, while on the disorganized papule the molecular détritus grows less, and new bluish epithelium-cells sprout up. In confluent papules the healing begins in the center, and gradually progresses toward the periphery. The vegetations that sometimes form upon the papules disappear by shrinking. Even ulcerating mucous-membrane papules leave no noticeable scars.

Ulcerating papules of the tongue and lips interfere greatly with mastication and speaking. Papules on the mucous membrane of the tonsils hinder the process of swallowing very much. Those in the Eustachian tube cause ringing in the ears, and temporary hardness of hearing. Patients suffering from sloughing papules on the tonsillary mucous membrane have a foul breath. Papules on the mucous membrane of the mouth cause an increase of the flow of saliva. Ulcerating papules at the commissures of the lips often prevent the mouth from being opened properly. Nurslings are hindered in sucking the breast when the papules are situated on the mucous membrane of the lips. Papules in the rectum interfere with defecation, and, like those on the vulva, cause pain in walking. In cases of ulcerating papules on the mucous membrane of the lips, the submaxillary glands may become inflamed; and in consequence of similar eruptions in the vagina the labia majora become œdematous, and cause indolent hypertrophy of the inguinal glands. Papules on the mucous membrane of the vagina, uterus, and the meatus, often cause slight blennorrhagic discharges from these parts. Sloughing papules on the mucous membrane of the septum nasi may destroy the perichondrium of the septum, and cause the tip of the nose to sink in (sheep-nose, or *nez de mouton*, of the French writers).

Papular syphilides and the morbid lesions occurring with

them in other organs usually accompany mucous-membrane papules. But erythematous and pustular syphilides may also coexist with the affection under consideration, and confluent impetiginous syphilide is especially apt to be associated with suppurating mucous-membrane papules. Sometimes this form of papule is the only evidence of syphilis, especially of the relapsing form.

Mucous-membrane papules originate as a result of acquired as well as of congenital syphilis; however, certain conditions may favor their formation. Thus, uncleanliness of the female genital organs and of the rectum will promote their development. Inveterate smokers, glass-blowers, buglers, and others get papules on the tongue and lips, places that are mostly irritated by the mouth-piece of the pipe and of the wind instrument.

The papules relapse even more frequently than those on the common integument, mainly, however, in the form of scattered or confluent pearly-white epithelial opacities of the tip of the tongue and mucous membrane of the lips, either shortly after an apparent recovery had been achieved, or even after the lapse of a year. Relapsing mucous-membrane papules run a much more obstinate course than the primary ones.

(3) The Syphilitic Node or Gumma of the Mucous Membrane.

A gumma develops in the mucous membrane, and in the submucous tissues in the same manner as in the cutis and subcutaneous tissue. But nodes of the mucous membrane are flatter, less prominent, and less sharply defined, hence more like diffused infiltrations. They may become as big as a pea or bean. Histologically and morphologically, gummata of the mucous membrane and of the skin are perfectly identical, and the former, like the latter, may disappear by absorption or degenerate. In the latter event, deep ulcers with hypertrophied borders are formed, because the nodes break down from within outwardly. The course of the mucous-membrane nodes is as protracted as that of gummata of the general skin. The ulcers that originate from their destruction do indeed heal sometimes in robust persons, but, as a rule, they grow larger both in

size and in depth, and give rise to horrible disfigurements and leave permanent deformities, by destroying portions of an organ, for instance, the uvula or a part of an eyelid; cause caries and necrosis of adjoining bones, such as the vomer; or, finally, perforation of the tissues, for example, the palate. The ulcer usually heals by contracting cicatrices, causing adhesions to form. Tubular organs, such as the pharynx, larynx, trachea, lachrymal sac, intestines, rectum, and urethra may become constricted.

Syphilitic nodes, like other specific affections of the mucous membrane, most frequently originate upon the mucous membrane of the mouth, especially on the tonsils, on the lips, on the velum palati, on the posterior wall of the fauces, borders of the tongue, on the lips, and on the hard palate. However, a gumma may also develop in the pharynx, in the sinus Morgagni of the larynx, and in the upper and posterior regions of the nasal passages. It occurs less frequently on the mucous membrane of the rectum and the cervix of the uterus, and still more rarely on the mucous membrane of the male urethra.

In most cases specific nodes of the mucous membrane and of the submucous tissue are the *only* perceptible external manifestations of an inveterate syphilitic disease. In other cases, however, there are also present those syphilitic morbid lesions in other tissues and organs that coexist with gummata of the skin and of the subcutaneous tissues.

Like gummata of the common integument, nodes of the mucous membrane, and especially those emanating from the submucous tissue, are not only the result of acquired syphilis, but frequently accompany that kind of congenital syphilis that first appears in youth.

These nodes relapse just as often as gummata of the integument, appearing months and sometimes years after the disease was apparently cured completely. A relapsing specific node may even recur upon the scar of a previous node.

In the vast majority of cases the manifestations of syphilis of the mucous membrane are confined to those regions that are visible; for instance, the mucous membrane of the nose, mouth, and fauces and their ramifications, the larynx and pharynx, the rectum and genital organs of both sexes.

Syphilis of the Mouth and Fauces.

In regard to syphilis of the mucous membrane of the lips and of the cheeks, the reader is referred to what was said in the general part on syphilis of the mucous membrane. The mucous membrane covering the structures that constitute the isthmus faucium becomes affected earliest and oftenest. We distinguish three kinds, namely, angina syphilitica erythematosa, papulosa, and gummosa.

Angina syphilitica erythematosa is distinguished from the ordinary inflammations of the fauces and from other specific affections of these parts by the facts that the *entire* part of the mucous membrane affected (soft palate, uvula, palatine arch, and tonsils) is livid in color; on both sides this terminates at the line separating the soft from the hard palate. Except that the uvula is sometimes elongated, no textural alteration can be detected in the diseased mucosa, and consequently the patients seldom complain of anything more than dryness of the fauces and slight difficulty in swallowing.

Syphilitic erythema of the fauces will disappear spontaneously if the patient takes proper care of himself. But if the pernicious causes continue, such as using tobacco to excess, it will extend to the Eustachian tube on the one hand and into the larynx on the other, and will cause noises and ringing in the ears (tinnitus aurium), and hoarseness (raucedo syphilitica). It very seldom becomes aggravated to a condition of actual follicular suppuration.

Angina syphilitica erythematosa very often accompanies the eruptive fever; in fact, it serves to make the symptomatology of syphilis complete, and consequently almost always disappears when the febrile symptoms have disappeared. In other cases it accompanies every syphilide of the early phases of the disease and lasts till the eruption has undergone resolution, or disappears and returns while the latter lasts. But it may return even after all the other symptoms have been apparently cured, in case the latter reappear. Angina syphilitica erythematosa *per se* admits of a favorable prognosis; but if it lasts a long while or repeatedly returns, it will excite apprehension that the isthmus faucium is so enfeebled that, in case

of a relapse, especially in debilitated persons, it will become the site of some grave lesion.

Angina syphilitica papulosa may or may not be attended by catarrhal swelling of the structures constituting the isthmus faucium. In the latter case no mucous-membrane papules in the isthmus become perceptible till they cause, in consequence of their disorganization, difficulties in swallowing. Those papules that are situated on the anterior surface of the velum and anterior arch of the palate generally are the best developed, while those on the tonsils are only rudimentary in form. Those situated on the anterior arch of the palate, on the tonsils, and anterior surface of the posterior arch of the palate, usually undergo degeneration very quickly, causing circular turgid spots on the mucous membrane, or, where the degeneration penetrated deeper, a diphtheritic pseudo-membrane will be poured out upon the affected part of the mucous membrane. This pseudo-membrane, which consists of molecular détritus, may gradually disappear and normal epithelium-cells then form, or it is cast off and the places then present the appearances of eroded ulcers. New papules may form on the periphery of these ulcers, which likewise subsequently degenerate, and the ulcers on the arch of the palate may spread in such a serpiginous manner as to extend upon the uvula in one direction and hard palate in the other.

Sometimes conical condylomata form upon the papules that are situated upon the uvula. If opaque or ulcerating papules occur on the tonsils, the latter will swell up to such a degree as to become flattened by mutual compression. The bolus of food, in passing over the ulcerating papule, rubs off the diphtheritic molecular coating, and the abraded, swollen mass, bereft of epithelium, and bleeding at the least touch, may be mistaken by inexperienced physicians for a deep abscess of the tonsil. Angina syphilitica papulosa sometimes causes severe temporary impairment of hearing, a condition which is readily explained by the fact that in the affected cases papules occur in the Eustachian tube.

Mucous-membrane papules constitute the most frequent syphilitic affection of the isthmus faucium, and occur in conjunction with all those phenomena which are associated with

moist papules of the common integument. They, too, heal by resolution, without producing any perceptible cicatrices, and, for that reason, the prognosis of angina syphilitica papulosa is not less favorable than that of angina syphilitica erythematosa. The papules of the isthmus faucium are not infrequently the harbinger of a series of phenomena of a renewed outbreak of syphilis.

Angina syphilitica gummosa very often attacks the tonsils, soft palate, and uvula. Generally, several nodes form simultaneously in the tonsils, whereby the latter may swell up to such a degree as to come in contact with each other, and the uvula placed between them, which, like the palate, is not only affected with catarrhal inflammation and elongated, but in addition becomes constricted and flattened. It is remarkable that the tonsils cause comparatively little pain, even during the act of deglutition, but they alter the voice so that it sounds hollow and dull, as if there were a foreign body in the mouth. On the other hand, the enlarged tonsils produce deafness, or at least hardness of hearing, by compressing the posterior arch of the palate against the fauces, and thus occluding the Eustachian tube.

At the beginning of the disease the tonsils present a smooth but hyperæmic appearance; gradually, however, the physiognomy of these glands changes according as softening and suppuration or absorption and shrinking of the nodes take place. In the first case, one or more excavations, depending upon the number of nodes, originate. These will display lardaceous bases, varying in size from a pea to a bean, and may coalesce. The absorption of the nodes formed in the tonsils is attended by repeated congestion of the entire gland. Every time an attack of congestion ensues, the minute free glandular acini secrete a viscid mucus, and remain swollen and catarrhally affected, while the intervening places that harbor the nodes shrink. As a result of this process, the tonsils display a caruncular, uneven surface, and are intersected by whitish stripes, consisting partly of cicatricial tissue, and partly of proliferating connective tissue. If these hypertrophied tonsils are extirpated, the wounds will suppurate for a long while.

The development of a syphilitic node on the *soft palate* is

likely to escape detection by the unaided eye for a long time, because it is generally met with on its posterior surface alone. The patient only complains of an unpleasant sensation in the velum and difficulty in swallowing. The velum is livid and painful when touched; the tonsils, the arches, and the uvula are œdematous. Suddenly, to the great terror of the patient, and often of the physician likewise, perforation of the palate takes place. To avoid being taken by surprise, by the occurrence of such an incident, the physician should never neglect, in these cases, to use the rhinoscope early and often, and to palpate the posterior surface of the palate with his finger. The opening may be of variable dimensions, and situated on any part of the velum. If it is situated near the free border of the palate, neither the voice nor deglutition will be affected. But if the perforation has taken place near the hard palate, a *nasal* or *snuffling* voice will result, and the food, especially fluids, will run out at the nose. The more intensely marked the inflammatory redness, and the more the vicinity of the perforated place is infiltrated, the greater the probability that the ulcer is progressing. But if the redness and swelling of the borders of the ulcer disappear under general and local treatment the aperture will gradually contract and cicatrize, leaving a minute, generally oval opening, which causes the patient no inconvenience whatever.

The gumma occurs more frequently on one of the lateral angles, which the palate forms with the uvula, than on the posterior surface of the velum. If such a patient is requested to pronounce the vowal *a*, it will be seen that the uvula does not contract, by becoming twisted upon itself in a vermiform manner, but is bent like a hook toward the affected half, because one of the parallel azygos muscles has lost its power of contraction. If the node undergoes disorganization, a deep abscess originates, which may ultimately slough away the entire uvula, or leave it hanging by a thin pedicle. If the sloughing of the uvula is arrested by early and successful treatment, a contracted cicatrix will originate, resulting in a permanent curvature of the uvula. A total loss of the latter neither affects the voice nor deglutition; indeed, in consequence of syphilitic affections of the fauces, certain morbid alterations

may ensue which cause the entire destruction of the uvula, and yet give rise to no inconvenience whatever. Thus, it may happen that when the posterior surface of the velum palati and the posterior pharyngeal wall are simultaneously suppurating, the mucous membranes of the opposing surfaces are brought so closely in contact with one another, by the swelling of the tissues, that adhesions form between them, and the entire free border of the velum and uvula becomes firmly united to the posterior wall of the pharynx by radiating white cicatricial tissue. This may occur to such an extent that communication between the pharyngo-oral and pharyngo-nasal cavity is totally blocked up, and the patient is compelled to breathe through the mouth alone. But if the patient loses the uvula before the velum becomes adherent, the latter will become fixed backward, and form a triangular fissure, whose apex is directed toward the hard palate, and base toward the posterior wall of the fauces—a deformity which does not interfere with the process of respiration in the least.

The *syphilitic affection of the posterior parts of the fauces*, like that of the pharynx, as a rule, does not become apparent until the specific diathesis has existed for some time. Erythema and papular eruptions attack these parts less frequently, and do not present any peculiar features. We have never been able to detect any mucous-membrane papules on the pharynx. Suppurating gummata are more frequently observed here. Gumma of the posterior wall of the fauces is usually situated along the lines corresponding to the transverse processes of the vertebræ. By the disorganization of the nodes, dirty, repulsive, deep ulcers originate; they may extend to the periosteum of the vertebræ, and cause caries and necrosis of the latter, whereby even the cervical spinal marrow may be laid open. In some cases—though fortunately this is very rare—the ulcers will spread, especially in cachectic persons, upward into the posterior nares, downward into the pharynx, and even into the larynx.

If caries and necrosis of the cervical vertebræ have developed, healing of the ulcer is hardly to be expected; but if the ulcers only affect the mucous membrane, they will heal, and radiating cicatrices will result. The cicatrix of the mucous mem-

brane has a glossy, dry appearance (xerosis), and the patients constantly complain of a feeling of dryness in the throat.

Ulcers of the pharynx (*pharyngitis syphilitica*) originate either by the extension of the ulceration from the posterior wall of the fauces, or by the disorganization of a gumma that has developed at the entrance of the pharynx. So long as the pharyngeal node is small and unopened the patients experience little more than dryness in the throat, but if it has broken open they will complain of burning and pricking pains, which become aggravated on swallowing. If the ulcer is confined to the pharynx, no alteration of the voice will result, but it is apt to extend downward into the larynx, and upward along the posterior wall of the fauces to the velum. For the purpose of discovering the site of the ulcer, it is necessary to depress the root of the tongue as much as possible; sometimes we may succeed in feeling with the index-finger its upper indurated margins. If the pharyngeal ulcer is small and superficial, it will cicatrize without leaving any mark; deep ulcers, on the other hand, always leave radiating cellulo-fibrous cicatrices, which may produce strictures of the pharynx.

Syphilitic Disease of the Tongue.

The tongue may become affected during the early period of syphilis, as well as during its latter phases. During the condylomatous stage, maculæ and papules, but no diffused catarrhal inflammation, originate upon the mucous membrane of this organ. During the gummatous stage, all the tissues entering into the structure of the tongue may be affected by the syphilitic process (glossitis syphilitica indurativa and gummosa).

The *macular form* manifests itself by a more or less pronounced, sharply defined, erythematous, circular, superficial eruption, mostly situated on the upper surface of the tongue. The spots generally develop without causing any pain; sometimes, especially when they have begun to undergo their desquamating metamorphosis, they occasion unpleasant sensations during chewing and speaking.

The *papular form* develops on the upper surface as well as on the margins and tip of the tongue. As a rule, five or

six papules, of the size of a lentil, originate, at the root of the tongue, but do not attract attention till their epithelial covering has become opaque, or the latter has already been cast off. They coalesce on the margins of the tongue and at the tip; they only appear in the form of opacities of the epithelial layer (psoriasis linguæ).

In consequence of the mechanical action of solid and liquid food to which the tongue is constantly exposed, and the pressure and irritation often caused by sharp and angular teeth, the primary type of the papules soon disappears, and they become converted into longitudinal or S-shaped, readily bleeding fissures, with a coating of grayish-white détritus, and markedly indurated borders, as a result of the inflammatory reaction. After these fissures heal, oblong cicatrices often remain.

Sometimes there are found, on the borders of the tongue and on the mucous membrane of the lips of syphilitic patients who have recently been subjected to an insufficient mercurial treatment, a number of aggregated whitish papular opacities, varying in size from a millet- to a hemp-seed, which the French writers call *muguet*, but, according to H. Zeissl's experience, are nothing else than papules that were aborted by the mercurial treatment.

Mucous-membrane papules of the mouth and tongue are most frequently mistaken for aphthous affection and sprue; further, for the morbid alterations which may originate from stomatitis mercurialis.

The following symptoms may serve to distinguish aphthous affections from mucous-membrane papules of the mouth and tongue: Aphthæ cause pain from their very beginning, even before the epithelial cells have become opaque. They present the appearance of small granules, are not bigger than a millet-seed, surrounded by a narrow zone, and on their apices a blackish dot is sometimes seen, due to a minute drop of blood; and before they become opaque, these granules often are converted into vesicles of the size of a pin's head. Mucous-membrane papules from the commencement display the features of flat pimples, are about the size of a lentil, have a dark-red color, are totally painless at this stage, and soon become covered with a pearly-white epithelial layer. However numerous aphthæ

may be, they do not become confluent, like syphilitic mucous-membrane papules. Aphthæ sometimes give rise to small ulcers, like erosions, which heal from the circumference toward the center. Syphilitic erosions, especially those that have been preceded by confluent papules, heal from the center toward the circumference. Aphthæ are seldom situated upon the tonsils and palate; syphilitic mucous-membrane papules are very often found in this locality. Aphthæ of the mouth, as a rule, is a disease of childhood rather than of adult life, and the aphthous spots in the former are situated almost always at the line of junction between the hard and soft palate, while syphilitic mucous-membrane papules never occur at this spot.

It will be quite easy to distinguish syphilitic papules from thrush, for the spores and fungi fibers (oidium albicans) may be readily seen with the microscope.

The morbid alterations which result as the effects of mercurial preparations are distinguished from specific papules by the following peculiarities: Mercurial sloughing sores occur almost exclusively on the borders of the tongue, on the mucous membrane of the lower lip and gums of the inferior maxilla. Syphilitic papules occur by preference on the upper surface of the tongue; less frequently and less numerously on its borders. The parts of mucous membrane altered through mercurial salivation never display the pearly-white, glossy color of the opaline plaques, nor the grayish-white appearance of the disorganized papules; their color is dirty-greenish, and they are covered with a soft, pultaceous slough. The morbid alterations produced by mercurial ptyalism are due, in the further course of the process, to disorganization of the normal mucous membrane; syphilitic mucous-membrane papules, on the contrary, represent disorganized inflammatory foci, in which a certain amount of plasticity is often noticeable by the fact that some of the papillæ found at these places proliferate, and this proliferating structure produces a hypertrophied epithelial envelope. In many cases the peculiar disgusting odor of mercurial stomatitis will promptly aid the physician in forming a correct diagnosis.

We have had several opportunities of treating an affection of the mucous membrane of the tongue which might readily

be mistaken for syphilitic plaques. This affection consists of a diffused thickening of the epithelial cells of the upper surface and borders of the tongue. The hypertrophied cells are cast off at some places, and then succeeded by new whitish cells that become thickened in their turn; or abrasions, deprived of epithelial cells, and which are exceedingly painful, result therefrom. The genesis of this lesion of the epithelial cells of the tongue, which is correctly designated as *epithelial catarrh* of the organ, is totally inexplicable. Sometimes it heals spontaneously and very quickly; sometimes, again, it speedily recurs as intensely as, if not more so than, before, and generally lasts several months. It is readily distinguished by the size of the hypertrophied epithelial cells, by the intensity of the pain, by the absence of all phenomena pointing to syphilis, and by the inefficacy of anti-syphilitic treatment.

Owing to the tendency to inflammations which syphilis provokes, proliferations of the connective tissue in various organs ensue. These proliferations are either diffused and noted for the tendency to become indurated, or they are limited to a few circumscribed parts, and then form nodes which very often and very quickly degenerate, and thus in a short time, often in a few days, cause a considerable amount of destruction. If the affection of the tongue has been preceded by a marked increase of the interstitial connective tissue, we call it *glossitis syphilitica indurativa*, while if nodes have formed it is known as *glossitis gummatosa*. Glossitis syphilitica indurativa may be either diffused or circumscribed, it may be limited to the mucosa, the muscular tissue or the interstitial connective tissue, or all of the tissues of the tongue may be simultaneously involved. In consequence of this condition the tongue often swells up so intensely that it is too big for the mouth. It is extremely red, occasionally markedly sensitive and painful. The swelling, hardness, and redness of course affect only the diseased part, which then projects above the level of the sound portion, and, owing to the disappearance of the papillæ, in consequence of the inflammation, looks as if it were scraped off. The sound part of the tongue may remain perfectly normal. The epithelial cells of the diseased places gradually become opaque, finally acquire a pearly whiteness, and, owing to the

saliva floating upon them, become glossy as if varnished. The alternate red, normal, and diseased white spots give the tongue a tiger-like spotted appearance (Fournier). If the inflammation is limited to a small superficial spot of the lingual mucous membrane, we call it *glossitis syphilitica circumscripta superficialis.* If the lingual muscular tissue is attacked by the circumscribed inflammation, it will feel to the touch like a hard, little lump, and the process will remind one of the disease in other muscles affected by syphilis. We call this form *glossitis muscularis syphilitica indurativa circumscripta;* if the entire or a greater part of the superficial surface of the tongue is affected, it is known as *glossitis syphilitica indurativa diffusa superficialis;* while if the inflammation has involved the greater part or the entire lingual parenchyma, it is termed *glossitis indurativa diffusa profunda.* This inflammation of the tongue may have a twofold termination. It may result either in a permanent hypertrophy of the tongue, or, in consequence of the shrinking of the neo-plastic growth, the organ may acquire a lobulated appearance. After the cessation of a circumscribed inflammation, a large or small node projecting above the surface of the tongue may remain, which is difficult to differentiate from an induration following an ordinary inflammation. Syphilitic inflammation that affects the entire parenchyma of the tongue may be succeeded by a condition that has been called *macroglossia syphilitica.* The borders of the tongue bear the impression of the teeth; if one of the latter is gone, a portion of the tongue may proliferate into the vacant space and fill it up entirely. When the neoplastic connective tissue shrinks, shallow or deep grooves of the tongue will result, depending upon circumscribed proliferation of the connective tissue. If the inflammation was diffused, the fissures will be so numerous as to give the tongue a ragged appearance. The furrows lying near the median line run parallel with it, while those on the borders are directed horizontally toward it. The entire diseased territory is nodular and uneven. In regard to the location of the affection, the upper surface of the tongue especially is affected, the lower being less frequently the site of the disease.

The second form under which syphilitic proliferations of

connective tissue may occur is, as we have already remarked above, *gumma syphiliticum.*

This kind of tumor, if it originates in the tongue, may be situated either in the mucous membrane or the muscular structure, or it may be so large as to involve the entire thickness of the organ. In regard to the gummata of the muscular tissue we believe that the tumor originally develops from the interstitial connective tissue, but after a while it encroaches upon the muscular tissue. In regard to the termination of the tumor, it may be made to disappear entirely, provided a judicious anti-syphilitic treatment is instituted early enough. The gumma disappears by resolution, often so completely that the texture of the tongue at the affected places atrophies to the thinness of a card. The majority of these neoplasms, however, if left untreated, will undergo disintegration. A caseous disorganization sets in at the center and spreads toward the circumference. Finally, an excavated ulcer with hypertrophied and sharply outlined borders originates and constantly extends into the adjacent healthy tissues.

If these ulcers are subjected to an appropriate local and general treatment, the hypertrophied borders will, first of all, grow thinner, and then the solution of continuity will be filled up by whitish, radiating, cicatricial tissue.

Gummata, originating in the mucous membrane of the tongue, will be most frequently met with at the apex of that organ, on its borders or in the space between the papillæ vallatis. Naturally the height of a gumma of the mucous membrane can not be very great, for the reason that the lingual mucous membrane on the anterior part, being intimately united with the muscle of the tongue, is quite thin. But toward the root of the tongue we occasionally find larger nodes, because here the mucous membrane is less firmly united to the subjacent muscular structure, and a comparatively large amount of submucous tissue is present.

A syphilitic node of the tongue develops without causing any pain; it is quite rare, and generally occurs singly. Sometimes it is the only striking symptom which points to the presence of the syphilitic diathesis that is undermining the entire system.

A lingual gumma renders speaking difficult and prevents mastication.

In patients suffering from inveterate syphilis we found repeatedly the plica fimbriata on both sides of the frænum of the tongue infiltrated and hypertrophied to such a degree that it looked like a supernumerary tongue.

There are probably no diseases that are so often mistaken for one another as carcinoma and gumma of the tongue. They differ, however, in the following particulars: Gumma never causes such intense pains as carcinoma. The disorganization of a lingual syphilitic node takes place from within outwardly; the disorganization of a carcinomatous tumor goes on from the circumference toward the center. Further, as a rule, the submaxillary and sublingual glands swell up in carcinoma of the tongue to a size never met with in syphilitic adenitis. The most important differential symptom whereby the physician will be able to distinguish epithelioma of the tongue from specific morbid alterations, is the sebum-like plug, which in epithelioma may be squeezed out from the diseased part of the mucous membrane, a phenomenon that never occurs in the syphilitic affection. A microscopical examination of the disorganized structure of carcinoma will reveal the well-known cancer-cells. If the physician does not find the differential symptoms enumerated here well marked, he may fall back upon the most reliable test, potassium iodide, which will cause the gumma to disappear in a few weeks, while in the carcinomatous disease it will be totally inert.

Finally, Hutchinson, in the "London Hospital Reports" for the year 1866, describes cases in which syphilitic nodes of the tongue became converted into carcinomatous tumors.

Syphilitic Disease of the Œsophagus.

Diseases of the œsophagus in consequence of acquired syphilis are extremely rare. We have never had the opportunity of seeing such a case, but a few undoubted instances of this disease may be found as curiosities in medical literature. The affection of the œsophagus generally is caused by gummata, which, if they undergo disorganization and contracting cicatrices originate during the process of healing, re-

sult in the formation of strictures of the tube. The simultaneous presence of some characteristic symptoms of syphilis in other parts of the body will materially simplify the diagnosis.

Syphilitic Disease of the Stomach and Intestines.

Lancereaux, Wagner, and Klebs have furnished us with dissertations upon syphilitic diseases of the stomach. Although affections of the rectum in consequence of acquired syphilis are apt to occur frequently, so far we have had no opportunity of seeing a case of specific disease of the duodenum, jejunum, ileum, or of the large intestines. Meschede, Oser, and Klebs have reported such cases. Affections of the small intestines in consequence of hereditary lues occur more frequently, and we will revert to the disease again when we come to speak of hereditary syphilis. As a result of acquired syphilis, the specific primary lesion, as well as luetic papules and gummata, occur in the rectum. The syphilitic primary lesion is liable to produce strictures of the rectum. However, we can only form a correct diagnosis if these strictures have been made to disappear under anti-syphilitic treatment without the co-operation of dilating instruments, and the so-called secondary phenomena subsequently appear upon the skin or on the mucous membrane without any other primary specific lesion having been observed on the patient. However frequently we saw papules *on and around* the anus, yet rarely did we see them on the mucous membrane of the rectum. Papules around the anal opening and in the anus frequently become exceedingly large in consequence of the irritation to which they are constantly exposed. They often degenerate, and as a result of the secretion which they discharge condylomata (exuberating conical condylomata) originate upon them. Disorganized papules of the rectal mucous membrane generally generate only superficial ulcerations, and hence in our opinion they seldom give rise to strictures of the rectum, though Muron and Malassez maintained that they are the most frequent factors in producing them.

The morbid alterations caused by gumma of the rectum are more severe than those produced by papules of that part.

The affection occurs mostly as a gummatous infiltration of the submucous tissue, by which some of the infiltrated longitudinal folds swell up and project above the others. By degeneration of the infiltrated material, there originate either on the edges of the folds or in the grooves between them narrow, dirty-looking, oblong ulcers, which penetrate the entire thickness of the mucosa, so that their bases are formed either by the submucous connective tissue or by the muscular layer of the sphincter. Cicatrization takes place either by a union of two or more adjacent folds, or, after a fold has been entirely destroyed by the ulcerative process that began on its margin, by granulations. In both cases the rectum often becomes so narrow that even an ordinary catheter can not pass through the constricted part. However, circumscribed gummata may also originate in the submucous tissues of the rectum, which may undergo degeneration, resulting in deep ulcers that penetrate the mucous membrane, and whose cicatrization is followed by grave strictures.

The painless, rapid development of these tumors, their speedy disorganization, and the fact that the disease mostly attacks younger persons; lastly, that they are preceded by other phenomena of syphilis—will aid the physician in forming a correct diagnosis.

In syphilis of the rectum, strictures do not form till the suppurating process has been cured, while in carcinoma the symptoms of stricture appear long before the cancerous degeneration sets in; and in addition the patients present the characteristic cachectic appearance.

The prognosis is unfavorable. It will be necessary to practice dilatation for a long time in order to relieve the patient of his malady. The dilatation of the gut must be carried out with the utmost care. We have seen severe peritonitis produced in cases where this procedure was performed in a rough manner.

If only the upper layer of the sphincter is affected by the degeneration and sloughing of a gumma, and the deeper ones continue to perform their function, a spasmodic closure of the sphincter during defecation, attended by severe pain, will result. But, if the muscular layers are destroyed at one or several places, a patulous state of the sphincter, involuntary evac-

uation of fæces, and prolapse of one of the walls of the rectum, will take place. The ulcerations finally may be so extensive that the descending colon is perforated, grave hæmorrhages ensue, and the patient dies from peritonitis.

Syphilitic Affections of the Liver.

Virchow divides syphilitic diseases of the liver into perihepatitis, interstitial and gummatous hepatitis. All these three affections may exist simultaneously, and, according to Virchow, perihepatitis and interstitial hepatitis are always found together. Perihepatitis is sometimes seen in the form of finely granular, miliary dots, extending over large tracts, but most marked where the process has attained its greatest degree of intensity within the organ. Not only do hard, thick, hypertrophies of the capsule form here, but almost always adhesions to adjacent organs, especially the diaphragm. These adhesions are remarkably thick and strong, so that long ligamentous strings and bands extend from the liver to the diaphragm. These strings of cellular tissue, however, also send prolongations into the parenchyma of the liver, which, like cicatricial substance, gradually contract, and cause shrinking of the superficial surface of this organ. The organ is transformed into a number of globular protuberances and globe-segments, i. e., it becomes multilobular. The lobulation of the liver, according to Rokitansky, is produced by the shrinking of the fibrous structure which has formed from a previous pylephlebitis in the course of the portal vein. According to Wagner, the projections of the liver originate from the contractions of cicatricial tissue that remains after the gumma has undergone resolution. Schüppel agrees with Wagner, but adds that the syphilitic neoplastic growth, if it occurs in the form of large nodes, preferably follows the course of the portal vein, and embraces it on all sides.

The new growth, the gumma, which is peculiar to syphilis, is mostly found wedged in between and near the hypertrophied cicatricial tissue just mentioned; the former, however, also occurs in apparently normal hepatic parenchyma. Hepatic gummata frequently attain the size of a pea, or even that of a hazel-nut. On incising a liver that has undergone the de-

generation above described, the gummata will be seen in the white cicatricial connective tissue, varying in form according to the stage of their development. Some are of soft, elastic texture, and for that reason spring up above the incisions, resembling very much, as L. Meyer, of Hamburg, correctly says, the glandular structure of the pancreas. They are yellowish, resemble tubercles, from which, according to Virchow, they are distinguished, in addition to their size, by their site within or near atrophied scars, next by their dryness and uniformity, since hepatic tubercles, if somewhat large, always become soft. The number of gummata that may be present in the liver varies very much; sometimes there are only two or three, sometimes again eight or ten, and in still other cases an even larger number have been found. The majority of them are situated upon the surface of the liver, and in such places where traction or some other mechanical irritation takes place; for instance, at both sides of the ligamentum suspensorium. It is true that they are found in the deeper parts of the organ also, but then they are almost always connected with the superficial surface by narrow fibrous brands which hold them low down by the retraction the latter undergo (Klebs).

The ramifications of the portal vein and of the hepatic and biliary ducts, however, usually do not remain unaffected. In consequence of the impeded circulation in the domain of the portal vein, ascites may originate, in the same manner as in interstitial inflammation, or in cirrhosis of the liver. It is not yet quite clear why icterus occurs in some cases and not in others. The substance of the liver remaining between the cicatrices and the nodes may be normal, or it may be in a condition of fatty degeneration (Frerichs); in other cases there is hypertrophy characterized by enlargement of the acini and liver-cells (Virchow); or, lastly, the nodes are imbedded in an amyloid liver. In addition, syphilis may produce that morbid alteration of the texture that has been denominated waxy liver (Wetzlar).

In the simple perihepatitic form the liver is somewhat enlarged, but it shrinks when the inflammation attacks the interstitial tissue (syphilitic cirrhosis); if gummata are present, it is usually larger; still, even in this case, it often becomes smaller,

in consequence of atrophy of the normal parenchyma. The syphilitic liver is permanently and extraordinarily hypertrophied only when it also undergoes lardaceous degeneration.

Syphilitic disease of the liver is very often associated with hypertrophy of the spleen. Otherwise it gives rise to the same symptoms as a non-syphilitic cirrhosis, such as dyspeptic phenomena, constipation, hæmatemesis, hæmorrhoids, epistaxis, anæmia, etc.

The most important sign pointing to the presence of syphilitic disease of the liver is undoubtedly the alteration of the organ itself; but despite a careful physical examination, and the indubitable anatomical signs furnished by the most pronounced morbid process, we are not always able to avoid making mistakes in diagnosis. Perihepatitis and cirrhosis syphilitica differ in no respects from other hepatic affections that result in either hypertrophy or atrophy of the organ. The presence of syphilitic cicatrices or nodes in the liver is the only reliable diagnostic sign; still, even in this case, it is necessary first to exclude all affections that occasion similar morbid alterations, such as the granular liver, carcinoma of the liver, the shrinking of the liver following obliteration of some of the branches of the portal vessels, and obsolete echinococci cysts.

In all cases the physician will find a detailed clinical history and thorough examination absolutely indispensable. Yet the statement of the patient should not be deemed sufficient. If there be the least suspicion that the case is one of syphilis of the liver, the organs in which the specific disease is apt to occur in various forms should be subjected to the most careful examination; for there will almost always be found cicatrices in the pharynx, swelling of the lymphatic glands, exostoses, etc.—in short, symptoms that have been designated with the names of secondary or tertiary syphilis. In regard to the diagnosis of waxy liver, Wetzlar maintains that, in those cases in which the history points to syphilis, and the physical examination shows the presence of the morbid alterations peculiar to that disease, although no other striking symptoms are present, such as might be expected from the extent of the disease, one is justified in assuming the lesion to be waxy liver, all the more so when it is associated with an enlarged spleen. It is not so

easy to decide to which stage of the syphilitic infection the hepatic affection belongs. Oppolzer, like Dittrich and Gubler, has seen cases of hepatic syphilis which were associated with the so-called secondary form; nevertheless, most instances belong to the later phase of the disease.

The affection of the liver that has just been described is also a tolerably frequent phenomenon in hereditary syphilis.

The prognosis is not absolutely unfavorable; indeed, instances of hepatic syphilis are occasionally found at the autopsy of persons who died from some totally different disease, and the affection of the liver was not even suspected, no symptoms of it having been present during life. In general, the prognosis is more favorable while the liver is in the stage of hypertrophy than when it has already commenced to atrophy. The concomitant affections of the syphilitic cachexia, dropsy, protracted diarrhœa, disease of the kidneys (amyloid degeneration), secondary inflammation of the pleura and lungs, are significant of an evil termination. According to Wetzlar, the waxy liver is speedily cured by specific treatment.

Syphilitic Affection of the Spleen.

Weil, of Heidelberg, described an enlargement of the spleen that occurs in the earlier stages of the disease, which he claimed could be made to disappear by antispecific treatment. Many writers have described morbid alterations of the spleen found in syphilitic cadavers, such as hypertrophy, thickening of the capsule, cicatrices, etc. In our opinion, however, these can not be ascribed to syphilis with absolute certainty. Nothing but gummata are infallible productions of syphilitic origin. Nodes in the spleen have been described by Rokitansky, Virchow, Biermer, Wagner, Gold, and other reliable writers.

Syphilitic Affection of the Pancreas and of the Salivary Glands.

No other instances of syphilitic affections of these glandular structures are known, with the exception of those reported by Lancereaux and Verneuil. The former found, in one case, two gummata in the pancreas, in addition to some in the muscles. In another case he found the submaxillary gland on the

left side markedly fissured and lobulated, very dense, yellowish, due to fatty degeneration; in addition, cicatrices of ulcers on the posterior wall of the fauces, conjointly with pulmonary and hepatic syphilis, and a gummatous tumor in the pericardium.

Syphilitic Affections of the Larynx and Trachea.

By Professor Schrötter.

We are unable to give exact figures in reference to the *frequency* of laryngeal syphilis in cases of general syphilis. We can only avail ourselves of the figures showing how many patients among those who sought relief from throat troubles suffered from laryngeal syphilis. If we avail ourselves for that purpose of the number of cases that came under our observation during eleven years (1871 to 1881 inclusive), it will be found that, among 21,044 cases of diseases of the throat, four and a half per cent were syphilitic, a number certainly less than has been supposed.

However, it may be observed that, in very many cases of general syphilis, the specific affection of the larynx is totally overlooked, because it often runs its course with such slight symptoms that the patients do not find it necessary to seek relief. Hence reliable statistics could only be obtained by subjecting every patient in the syphilitic department of a hospital to a laryngoscopical examination.

In regard to *age*, it is found that in men, those between twenty and thirty, in women, those between seventeen and thirty years, form the bulk of the patients. Children, according to our observations, seem to be even less affected than very old persons, among whom there was one man of seventy-four and one woman of seventy-two years.

In regard to *occupations*, notwithstanding the great mass of material at our command, no definite facts could be gathered tending to show that it exercised any influence upon the specific disease of the larynx. Nor could it be proved that persons who work mostly out-of-doors, or those compelled to talk a great deal, were especially liable to this form of disease of the larynx.

Acute and Chronic Catarrh.

Levin, who has a large field of observation, recently made the assertion that the affection of the larynx, as a result of syphilis, never becomes catarrhal, always remaining erythematous in degree. We can not coincide with his view of the matter, for, not only are the various degrees of redness (hyperæmia) to be seen on the affected mucous membrane, but even such symptoms as are produced by affections of other mucous membranes collectively, and have been called catarrh, are present here.

There is found a slight or more marked swelling, not only of the affected structures, but, as Levin himself has admitted, of the submucous tissue also, and an alteration of the secretion; in some cases it is diminished, in others again considerably increased. Furthermore, the epithelial cells, especially on the vocal cords, are cast off in some places, in others markedly thickened—conditions that are admitted by all authorities to constitute catarrhal disease.

The duration of the affection, too, is very often greater than in erythema. Lastly, we have the fact, and certainly it is not an unimportant one, that such a pathological condition heals very rapidly under an anti-syphilitic treatment, while it most obstinately resists a treatment with anti-catarrhal remedies, such as astringents, etc. This certainly proves that it was not a mere accidental affection, such as is caused by a cold from which the syphilitic patient was suffering.

The catarrhal affection very often accompanies a catarrh of the fauces. The phenomena are not more serious, save in remote complications, and generally present the appearances of subacute and chronic inflammation.

There are no differential data for distinguishing it from idiopathic catarrh, or from that occurring in consequence of other affections. At one time we thought that a greater degree of exfoliation of the epithelial cells, especially on the borders of the vocal cords, occurred in syphilitic catarrh, than in the non-specific affection. Subsequent experience, however, has taught us that this view was incorrect; neither does the quality of the secretion supply any proof of the character of

the lesion. The same kind of tenacious mucus occurs on the margins of the vocal cords—it agglutinates them; and, when it becomes dry, forms crusts as in the idiopathic form. Nor would it be correct to state that the duration and the obstinacy of the disease furnish any indications regarding its syphilitic character.

Hence the diagnosis can only be confirmed by the simultaneous presence of other syphilitic evidences, which are often plainly manifest by the swollen cervical glands; yet even this does not establish the diagnosis beyond all cavil, for it is quite possible that the patient has suffered from laryngeal catarrh before he acquired syphilis, or that the affection was produced by some other causal condition.

Although it must be conceded that this form of syphilitic infection, like the more intense manifestations of the specific disease, may be cured by a general anti-luetic treatment, still it can not be denied that local treatment is of the greatest benefit. We do not mean a mere symptomatic treatment, such as, for instance, the inhalation of narcotic remedies for the relief of the cough and the tickling and scratching sensation in the throat, but the local use of anti-syphilitic agents, such as inhalations of iodide of potassium, or a weak solution of the bichloride of mercury, or penciling with iodo-glycerine, etc.

If we do not speak of œdema of the larynx here, it is because we do not believe that it ever develops from a simple catarrh, but is always a collateral manifestation of disease of the deeper tissues, infiltration of the submucous structures, or still more frequently of the perichondrium.

Papules.

Papules are a tolerably rare form of disease in the larynx; at any rate, they occur less frequently even than is supposed. Now and then they are found on the margin of the epiglottis, over Santorini's cartilage, on the posterior surface of the arytenoid cartilages, and most frequently on the arytenoepiglottic folds, in the form of oblong or rounded projections or swellings, varying in size from that of a lentil to that of a pea, and having a bright-red color. Gradually they grow here

above the level of the tissues; sometimes they are distinctly outlined; sometimes, again, their borders are indistinct. Their upper surface, as a rule, appears granular, because the epithelial cells soon disappear; some of them, however, are covered with a thick, whitish matter. If the epithelial coating is entirely gone, a few minute, red points are seen upon the yellowish purulent base of the papule. These forms may also occur on the anterior surface of the posterior laryngeal wall; still, as it is impossible to obtain a satisfactory view of this region, nothing definite can be said upon that point; for hypertrophy or exfoliation of some layers of the epithelial cells occurs so frequently as a consequence of chronic catarrh alone, that one must be very careful in judging pathological alterations occurring on these places. No post-mortem examination of this lesion has ever been made.

This form of disease, at any rate, occurs very rarely on the true and false vocal cords, and it will scarcely be possible to differentiate it definitely from other kinds of syphilitic infiltrations, which, when they undergo degeneration, go on to ulceration.

Infiltrations, Gummata.

Under this head, not only the circumscribed tumors, but infiltrations, such as often attack all the tissues of the larynx in a diffused manner, occurring in consequence of syphilis, belong. They occur more frequently than the former variety, and since they often terminate in grave, morbid alterations, are of much greater prognostic importance.

They may occur on the *epiglottis*, partly in the form of single or multiple aggregated nodules of various sizes, partly as uniform hypertrophy of either its laryngeal or lingual surfaces, or both. In the severe forms of the disease, the graceful form of the epiglottis is lost, owing to the thickening of its substance, and in the highest grade the hypertrophy may be so great that both lateral borders touch each other, and then it becomes totally impossible to obtain a view of the laryngeal cavity.

The same is true of the infiltrations in the *aryteno-epiglottic folds*. Here thick callosities also form. If the latter develop on the *arytenoid cartilages* also, the entire space between

them will be filled up. If the gummata are located about the joints of the arytenoid cartilages, the movements of the latter will be markedly hindered.

These hypertrophies are generally very dense, and the probe makes little impression upon them.

They occur in various forms on the *true vocal* cords. Now, one or both vocal cords are swollen to such a degree that the patient is in danger of dying from asphyxia; then, again, there is only a slight circumscribed swelling, which generally runs along the length of a cord, and is either pale or livid. Lastly, that form of tumor is of especial interest which has its starting-point from the lower surface of the vocal cords. As is well known, the border of the vocal cord, under normal circumstances, constitutes a cavity facing downward and inward. In the infiltrations under consideration, so great a convexity projecting into the larynx may originate in place of the concavity that the tumors thus formed in the median line touch one another, especially anteriorly, and thus only a small space remains posteriorly for the passage of air. This is a very frequent form of laryngeal stenosis. Now and then a distinct boundary-line originates also between such an hypertrophy and the edge of the true vocal cord, the infiltration being less marked on the connective-tissue lines running between the elastic fibrous bands. This often produces a picture, as if the vocal cord were split lengthwise; and as this condition may occur physiologically (by the origin of the elastic fibrous band from the processus vocalis), and also from the ulcerations that creep along the whole length of the vocal cord, it is necessary to pay particular attention to it.

If these infiltrations involve the *false vocal cords*, the condition soon manifests itself by the occlusion of the sinus Morgagni, and more or less covering up of the true vocal cords, the latter becoming more curved upwardly. This is usually attended by a marked increase of the redness, while on the true vocal cords the redness does not become so intense till later in the course of the disease, when purulent destruction occurs.

The *nodular form* occurs on the lingual as well as on the laryngeal surface of the epiglottis—on the latter most fre-

quently, perhaps on its petiolar part, on the ary-epiglottic folds, on the head and posterior surface of the arytenoid cartilage, on the central part of the false vocal cords, on the lower surfaces of the true vocal cords, and, lastly, in the trachea too. The upper surface of the nodes, so long as they do not ulcerate, are perfectly smooth; at first they are quite dark, but later become bright red.

All these forms of nodular growths may be so completely absorbed that not even the place where they were situated can be found, or a less or greater degree of degeneration often takes place very rapidly, resulting in a *syphilitic ulcer*. It is a much rarer occurrence for such a swelling to terminate in permanent hypertrophy by an abundant proliferation of connective tissue.

The fatty or lardaceous degeneration of the laryngeal muscular apparatus may be considered as still another termination of the syphilitic inflammation.

It is evident that, under all these circumstances, a number of factors may concur that will change the voice from a slight hoarseness to total aphonia.

Ulcers.

These often develop with surprising rapidity. On the places where yesterday a marked redness still prevailed, to-day an ulcer with partly smooth and partly ragged edges is found. It is sharply defined, and its base may be red and transparent, or covered with yellowish matter. It is generally also surrounded by a red border.

In the progress of the disease the ulcer may become of immense size. It may not only extend from the free margin of the epiglottis to both its upper and lower surfaces, but even to the cartilage. After the complete termination of the ulcer, which is usually asymmetrical, the cartilage is entirely exposed, or projects, at both ends of the ulcer, in the form of a sharp prong. If the ulcer extends to the ary-epiglottic folds, or if it originated upon the latter, or upon the arytenoid cartilage, the rigidity of the affected structures will frequently attract attention.

Here, as in ulcers upon the false vocal cords, the borders

of the ulcer are not infrequently thickened like a rampart. Such ulcers are very often found upon the anterior surface of the posterior wall of the larynx, and these are the ones that so often deceive the physician. As has been intimated, it is not even possible to get a good view of this part of the larynx, and when an ulcer occurs here little more than its upper border will be seen. If it is at all fissured, or undermined, there originate, as viewed from above, indentations, which, to those unfamiliar with the true nature of the lesion, will appear to be excrescences, vegetations, condylomata, polypi, etc. As a protection against committing such an error, we will mention the facts that neoplastic growths are exceedingly rare at this place; that the fine indented border of the projection, which is occasionally well defined, is readily recognized as a portion of the ulcer; and, lastly, that the ulcer extends from the posterior laryngeal wall to the lateral parts of the vocal cords. These data, no doubt, will put an end to all danger of error.

Ulcers on the *false* and *true vocal cords*, especially on the latter, spread in the direction of their long axis, destroying the borders and even a considerable portion of the cords. Often they extend so deep that the processus vocalis is exposed.

The ulcer may extend downward into the *larynx*, *trachea*, and even into the *bronchi*. Not infrequently extensive ulcers occur, particularly at the bifurcation of the trachea. They often penetrate deep enough to perforate the trachea and attack the adjacent organs.

The surface of the ulcer is usually covered with tenacious purulent matter.

The question occurs very often, How can syphilitic ulcers be distinguished from other forms of ulcer, especially scrofulous, tuberculous, typhous, lupous, or carcinomatous ulcers? The question is easily answered: The character of the ulcer, as a rule, can only be definitely settled by the clinical demonstration of syphilis, or by the exclusion of other primary diseases. When this can not be done, the diagnosis will remain uncertain.

This will become perfectly clear when we review the individual symptoms.

The *site* of the ulcer is no guide in forming a differential diagnosis. All kinds of ulcers occur on those parts of the larynx that are rich in glands; thus, syphilitic, like tubercular ulcers, are met with on the anterior surface of the posterior wall of the larynx, on the petiolar part of the epiglottis, on the borders of the false vocal cords, and, lastly, on any other part of the larynx. Notwithstanding our very extensive experience we are unable to indicate any site of predilection of syphilitic ulcers in the larynx.

It is true that the *sharp border* and the arched indentations of the ulcer speak with greater certainty for syphilis than for tuberculosis; but, then, such conditions sometimes occur, not only in tuberculosis, but even in sloughing carcinoma, in which disease they are sometimes very pronounced.

Tuberculous ulcers are often so covered with tenacious purulent matter, and so enveloped in it, that their base can not be seen. After the secretion has been removed, by the expulsive efforts of coughing or with a brush, the base will be found tolerably clean, pale, and slightly granulating. In a syphilitic ulcer, the discharge is less profuse, but, nevertheless, it is so intimately united with the base of the ulcer that it is almost impossible to brush it away.

The condition of the *tissues* around the ulcer is a very important symptom. In syphilitic ulcerations the surrounding tissues are mostly bright red, while in tuberculous ulcers not only the parts near them, but the entire laryngeal mucous membrane, is pale, often to a remarkable degree. Still, even this sign is not absolutely reliable; for tuberculous ulcers may, on the one hand, be surrounded by reddened tissues, and, on the other, all mucous membranes in protracted syphilis may have an extremely anæmic appearance.

So far we have only seen *one* phenomenon, which was frequently present in the vicinity of tuberculous ulcers, but never in consequence of syphilis—namely, a number of *yellowish dots*, varying in size from that of a pin's head to that of a millet-seed, which represent so many minute infiltrated glands. At first, they are somewhat scattered, but subsequently become more aggregated. After they undergo degeneration, in some cases, ulcers are seen to form, which grow larger and larger by the

coalescence of some of the foci. We have paid particular attention to this condition for a great many years past, and always found it to be a reliable diagnostic feature. These yellowish dots should not be confounded with the yellowish granules that are sometimes found in the vicinity of a carcinoma; in the latter case, they are larger, and distinctly range above the level of the normal mucous membrane.

The condition of the adjoining nasal, pharyngeal, and oral mucous membrane may be regarded as a reliable guide. It is true that, in all probability, when the ulcer is extremely large, extending from the soft palate, root of the tongue, and the faucial mucous membrane, to the larynx, one will be apt to think of syphilis and not of tuberculosis: it might be perfectly safe to do so if a scar is found at the same time on one of the places mentioned. Yet, aside from the fact that tuberculous persons may also have syphilitic ulcers on the mucous membrane, and that in tuberculosis extensive ulcers, reaching from the root of the tongue to the soft palate and the gums, also occur, another difficulty becomes superadded, under these circumstances, namely, the differentiation between *syphilitic* and *carcinomatous* ulcers.

We can recall more than one instance in which, after carefully examining the entire body, we were unable to make a differential diagnosis between syphilis and carcinoma. After succeeding, in some instances, in bringing about a cure of the ulcers under anti-syphilitic treatment, we deemed ourselves justified in concluding the disease to have been syphilis. But when, after a short time, the ulcers broke out again, we found ourselves in the same doubtful position as before, and this was not cleared up till the fatal end.

Swelling of the lymphatic glands in the submaxillary region, and lower down in the neck, furnishes no differential diagnostic signs; in a milder form, it occurs in tuberculosis; in a severer form, in cancer as well as in syphilis.

Lastly, in regard to typhoid ulcers, it will not be difficult to distinguish them from syphilitic ulcers when the whole morbid picture is reviewed, and ulcers as a result of lupus are found only when this affection occurs on other places.

Hence, from all that has been said above concerning the

differential diagnosis of laryngeal ulcers, it will be apparent that in all doubtful cases it will be necessary to carefully examine the whole body, and minutely investigate all the circumstances of the case. The *symptoms* of an *ulcer* of the larynx vary according to its site.

An ulcer in the larynx alone, as a rule, causes no difficulties in swallowing. This is especially true in contradistinction to the wide-spread erroneous views concerning ulcers on the epiglottis. Precisely as in tuberculosis difficulties in deglutition are only present when the ulcer spreads from the lateral wall of the larynx upward to the pharynx; but especially is this the case when ulcers spread from the anterior to the posterior wall of the larynx. In the last two instances the pains which often radiate to the ear may be so intense that the patients decline to partake of any nutriment. Still, as a rule, the difficulties in deglutition are greater in tuberculous than in syphilitic patients. Hoarseness is present when the vocal cords are directly affected or when they are less movable, or when the patient on account of pain avoids bringing into tension the necessary apparatus for the production of phonation.

Hæmorrhages in consequence of syphilitic ulceration of the larynx are always slight; generally there are only a few dots, or, at the most, streaks of blood in the muco-purulent expectoration. We at least have never seen any bleeding worth mentioning in syphilitic ulcers of the larynx, though we have witnessed some profuse, even fatal, hæmorrhages in tuberculous ulcers of the fauces.

The secondary symptoms in the larynx appear at the same time after the primary infection, as on the other parts of the body. Sometimes the phenomena in the larynx occur for the first time so late, so many years after infection, that it is difficult to trace any connection between them. It is necessary to remind the reader here of the question that has recently been discussed so much of the occasional late occurrence of hereditary syphilis.

Although there is no doubt whatever that the *general* treatment, whether it consists of the inunction of mercury or the internal administration of iodide of potassium, corrosive sublimate, Zittman's decoction, etc., is the most important, still it is not well to discard the local treatment entirely. Just as

little as we are satisfied to treat extensive specific sores on the skin with Zittman's decoction alone, but employ, in addition, lotions, plasters, and ointments in the most active manner, so little should we be content to await the effects of internal treatment in syphilitic laryngeal ulcers, for instance, on the vocal cords, without resorting to the use of local remedies before an irremediable loss of substance or erosion of the cartilages has taken place.

The form of local treatment necessary in any given case will depend upon special circumstances; but it will always be more advantageous to treat the affected places, if possible, by direct applications; we mean thereby that more good will be accomplished by penciling the ulcers in the larynx with a solution of nitrate of silver, iodo-glycerine, tincture of iodine, etc., than by inhalations. Of the latter, those consisting of iodide of potassium or iodide of sodium are to be preferred, while corrosive sublimate always gives rise to unpleasant secondary effects. Insufflations of finely powdered iodoform upon the ulcer have proved to be of great benefit.

In ulcers of the trachea local treatment is not only useful, but often absolutely necessary, especially in those cases in which there is a marked accumulation of mucus or crusts that adhere tenaciously.

Perichondritis.

This is one of the most frequent forms of disease in syphilis; and syphilis, again, is one of the most frequent causes of perichondritis laryngea. It occurs on all the cartilages of the larynx, and may start from the perichondrium itself as well as from ulcers of the mucous membrane that spread to the cartilage. The lesion may terminate in all those morbid alterations that follow perichondritis in general, namely, abscesses, spreading of ulcers, grave destruction of carious cartilages which have become ossified, exposure of the cartilage in a suppurating cavity, and formation of cicatrices, with consecutive disfigurement of the shape of the larynx.

Cicatrices.

Syphilis is the most frequent cause of scars in the larynx. It is evident, from what has been said upon the subject of ul-

cers, that they may occur on any part of the larynx. In the slightest grades they require the closest inspection to see them; in other cases, again, they are extensive and characteristic, being met with in connection with ulcers on the hard palate, that has already been partly destroyed, on the root of the tongue, or lateral and posterior walls of the fauces.

The disfigurement of the remains of the epiglottis may be very extensive; we know, however, that deglutition even in cases of complete loss of the epiglottis may be accomplished without any difficulty. In scars of the posterior laryngeal wall and the vocal cords the glottis not infrequently is distorted. Those forms in which bridge-like bands originate on the ary-epiglottic folds, and especially on the false vocal cords, are very remarkable. Further, those scars that are on a level with and below the vocal cords, and which either bring about adhesions between them or membranous contractions of the glottis, deserve special mention. These contractions generally occur at its anterior angle; sometimes, however, they line the larynx in an annular form.

There occurs very often from the contractions of the cicatricial tissue, and the constriction of the blood-vessels resulting from it, disturbances of the circulation, followed by marked bulbous and œdematous thickening of some parts; even new ulcers form again as the result of this pathological condition.

Cicatrices on the posterior laryngeal wall surrounding the crico-arytenoidal joint will render it immovable.

Scars often have a characteristic appearance. Still, a thorough examination of the clinical history of the case is indispensable, for other processes, especially eschars produced by solutions of caustic potash, may give rise to similar cicatrices.

A scar very much like that described above occurs also in the trachea. Cicatricial bands that transverse its lumen in the form of a network are of great importance, for a slight accumulation of the secretion at this point may occasion the most dangerous attacks of suffocation if some of the meshes of the network become plugged up, and thus reduce the caliber of the trachea.

Cicatricial contractions of the larynx may require various degrees of surgical interference. They may be so severe as to

call for laryngotomy. If membranes have formed between the vocal cords and adhesions between the latter, their division with the knife will accomplish excellent results. These bloody operations must be supplemented by the use of laryngeal bougies of gradually increasing thicknesses, according to Schrötter's method. If the false membranes or scars are not very thick, dilatation by means of bougies alone will in many cases answer completely.

Constrictions of the trachea are to be treated in a similar manner.

New Growths.

Gummata having been already described, those growths which occur singly or in groups, and resemble pointed condylomata, remain to be spoken of here. They are met with mainly on the soft palate, upon the arytenoid cartilage and epiglottic folds, not so often on the anterior surface of the posterior laryngeal wall and on the vocal cords. Sometimes they form such high cockscomb-like excrescences that the probe sinks in between them to a depth of several millimetres. Painting them with tincture of iodine will cause them quickly to disappear.

These new growths, according to published reports, have also been found in the trachea.

In conclusion, it is necessary to allude to those forms of disease which, although produced by syphilis, are not located in the larynx, and only manifest their influence upon this organ. Syphilitic diseased glands which temporarily or permanently interrupt the functions of the superior laryngeal nerve, or still more frequently the inferior laryngeal nerve, cause, by the resulting paralysis of the muscles of the larynx, not only hoarseness and aphonia, but even dangerous symptoms of suffocation. In these cases, the nature of the primary affection often remains an unsolved problem in physical diagnosis.

Syphilitic Affections of the Bronchi and Lungs.

From the character of the morbid lesions found after death, Virchow came to the conclusion that syphilitic *ulceration*, with consequent cicatrization and stenosis, may occur in the bronchi, as it does in the larynx and trachea. Syphilitic bron-

chitis may merge into chronic pneumonia, and the latter terminate in hyperplastic induration of the pulmonary structures. This form of *interstitial pneumonia* of specific origin is said to occur idiopathically also, and lead to the formation of callous nodules, of strong cicatricial bands running through the pulmonary tissues, and of cicatricial retractions of the pulmonary surfaces. Gummosities in the lungs undoubtedly occur in hereditary syphilis; in the acquired form they have been frequently met with and described. Nevertheless, their presence is not easily demonstrable, either clinically or pathologically. We must be able beyond a doubt to exclude the presence of tuberculosis, and for that purpose take into consideration the site of the morbid deposits. Gummata occur all over the lungs, while tuberculosis, in the vast majority of cases, is found at the apices. Finally, the antecedents and concomitants, the course of the disease, and the effects of anti-specific treatment, are very useful data in diagnosis. On the pleura, too, syphilitic cicatrices, with prolongations extending into the pulmonary tissues, are said to occur.

[Pulmonary syphilis is properly regarded as a late manifestation of the disease. It occurs mainly in two forms, diffused and circumscribed. The diffused deposits are found along the course of bronchi and their ramifications, resulting in peribronchial infiltrations, whose retraction subsequently occludes the lumen of the bronchial tubes, producing collapse of that portion of the lung. If the infiltration extends to the surface of the lung, it will become apparent even before the pleura is removed. The circumscribed form occurs as gumma nodes, varying in size from that of a small kernel up to that of a walnut, and even larger, which are found imbedded in the pulmonary tissue. These gummata may undergo absorption, fatty degeneration, cheesy transformation, or softening and suppuration, but, in any event, callous cicatrices of dense connective tissue always remain. The diffused and circumscribed forms are pathologically alike, and differ only as regards their location.

This lesion, as already observed, presents no pathognomonic symptoms. But if dullness, on percussion, is found over a circumscribed space, and dyspnœa supervenes rapidly, in a well-developed, robust person, unattended by hectic fever,

and some of the late evidences of specific disease are present, the disease may be considered pulmonary syphilis. The treatment with the iodides, and the absence of tubercle bacilli from the sputa, will, perhaps, form the most reliable evidences of the nature of the disease.]

Affections of the Kidney, Suprarenal Capsule, and the Bladder.

In addition to other diseases of the kidney found in syphilitic patients, which, however, can in no way be distinguished from the pathological lesions found in non-specific Bright's disease, gummata and chronic interstitial, syphilitic, inflammatory circumscribed deposits have also been described by medical writers. A few instances of similar affections of the suprarenal capsule are also recorded.

In a few rare cases, syphilitic ulcerations and subsequent cicatrization occurred in the bladder, these processes being usually accompanied by similar lesions in the urethra (Proksch).

Syphilitic Affections of the Testicle and Spermatic Cord.

The term *syphilitic disease of the testis* (orchitis, albuginitis, or sarcocele syphilitica) is applied to an inflammatory affection starting from the albuginea of the organ. In consequence of this, the albuginea and the cellular prolongations that extend from it into the substance of the testis, dividing it into small lobes, may become markedly thickened by proliferation of the connective tissue. In addition to this, however, there are sometimes found, under the thickened envelope of the specifically diseased testicle, distinctly outlined nodules, as big as millet-seeds, containing a firm, yellowish nucleus. These have been regarded by Virchow and others as gummata. Hence, a simple orchitis syphilitica and an orchitis gummosa may be distinguished. But whether connective tissue alone has formed, or gummata have developed, can not be positively ascertained during the life of the patient.

A commencing syphilitic disease of the testicle generally runs a totally painless course, and, for that reason, hardly ever attracts the attention of the patient. In exceptional instances, it manifests itself by slight pains, which run along the spermatic cord, radiating toward the corresponding inguinal

region, but which are not aggravated by pressure upon the cord, a condition which Dupuytren considered as characteristic of syphilitic disease of the testicle. If the testis is carefully examined at the beginning of the disease, one or more scattered, nodular, hard places, about the size of a hazel-nut, are found on its surface.

By the gradual enlargement in circumference of the originally indurated places, or by the gradual coalescence of the scattered inflammatory foci, the testis uniformly swells up, becomes as hard as cartilage, and twofold or even threefold its normal size. It thereby loses its oval shape, and becomes pyriform, with its base directed downward and its apex drawn up toward the groin. The swollen testis is less sensitive to pressure than a normal one. The epididymis, and the corresponding vas deferens, as a rule, remain unaltered. In exceptional cases, however, the epididymis becomes involved in the pyriform swelling and the vas deferens is hypertrophied to twofold and even fourfold its normal thickness.

In some cases, a serous effusion takes place into the cavity of the tunica vaginalis propria. This hydrocele, which has been described as orchitis serosa, or vaginalis, and by Virchow termed periorchitis syphilitica, does not seem to us to stand always in causal relation to syphilis, but very often depends upon a transudation resulting from a simple passive stasis of the blood.

Like its development, the entire course of the disease of the testis is slow and chronic. Its duration is uncertain; sometimes it is prolonged for two or three years. During this period, however, the testis may spontaneously become smaller and larger again. So long as the swelled testicle is of moderate size, the scrotal integument suffers no morbid alteration; but, when it has attained marked dimensions, or a considerable amount of serum at the same time is effused into the cavity of the tunica vaginalis, the wrinkles of the affected half of the scrotum gradually become effaced, and the skin of the scrotum erythematous.

Syphilitic inflammation of the testis generally terminates by absorption of the inflammatory products. Sometimes, however, the resolution oversteps the limits of a normal condition; the

testis becomes smaller than it was before, and, finally, is atrophied so much that it is reduced to a mere rudimentary condition, not bigger than a bean or pea. Further, there are cases in which the affected testis is converted into a mass as hard as cartilage or bone. A syphilitic testis seldom undergoes suppuration.

As a result of syphilitic disease of the testicle, the secretion of semen is greatly diminished or totally arrested. If both testes are rendered functionally inefficient by specific disease of a high degree, a diminution of erections, loss of sexual appetite, and, finally, with increasing atrophy of the glands, complete impotence will result. Ricord states that the semen secreted by such testes is diminished in quantity and changed in quality; that it contains no spermatozoa, and is simply a thin, transparent fluid. In the testicles of robust persons, who bore indications of having had syphilis which, however, had been completely cured, Levin found the spermatozoa were often absent (in fifty per cent). These statements agree entirely with the observations made by H. Zeissl. He knew many men who had suffered from syphilis, and, notwithstanding that they possessed strong constitutions, begat no children, though their wives were perfectly healthy.

At any rate, it is probable that the origin of syphilitic disease of the testes may be fostered not only by certain local influences, such as a fall, a blow on the testicle, or excesses in venery, but that even remote causes, such as epididymitis blennorrhoica, tuberculosis of the epididymis, or carcinoma of the testicle, may serve to engender a specific orchitis. But we must confess that, although very many of our syphilitic patients suffered from gonorrhœa, yet no sarcocele was produced.

In all cases that came under our treatment the affection of the testicles was the result of acquired syphilis. As a general thing, only one testis was diseased—now the right, and then again the left. In a few rare instances the second testis was attacked some time after the first. Orchitis syphilitica occurred most frequently in persons who were suffering from syphilitic ecthyma or specific nodes of the skin or mucous membrane.

The affections of the testes, which may be mistaken for syphilitic inflammatory orchitis, are tuberculosis, carcinoma, and gonorrhœal epididymitis.

Tuberculosis of the testes, as is well known, always begins in the epididymis, and is either limited to this part, or subsequently extends to the entire organ. The specific affection, however, attacks the testis first, the epididymis generally remaining normal. Tuberculosis produces a nodular, uneven enlargement; syphilis a smooth, uniform tumor. As a result of tuberculosis, inflammatory conditions of one of the testes sometimes supervene, which generally terminate in suppuration, while syphilitic affections of the testes develop without fever or inflammation, and very seldom undergo suppuration. At the beginning, tuberculosis of the testes, like the syphilitic variety, is painless, but later, when the tuberculous affection approaches suppuration, the patient suffers severe pain, while even strong pressure on the testicle, which is greatly enlarged as the result of syphilis, causes no unpleasant sensations.

It is more difficult to distinguish a recent syphilitic orchitis from a *commencing cancer* of the testicle.

Both affections develop in the testes, both are at first painless, and present one or more circumscribed, hard, nodular places. But cancerous nodules grow much more rapidly than the syphilitic node, and in the former the testis acquires a nodular surface, while the latter, owing to the fusion of the deposits, becomes uniform and smooth. The longer the carcinomatous growths last, and the older they grow, the more elastic they become; i. e., the less hard they are to the sense of touch. Gradual softening and fluctuation of the carcinomatous kernels ensue, attended by intense, protracted pains, and followed by bursting and ulceration. A syphilitic testicle, on the contrary, almost always remains stationary in its indurated condition, or it disappears almost entirely, and very seldom undergoes suppuration. In syphilitic inflammation of the testis the vas deferens usually remains unaffected, and when it becomes diseased it is transformed into a uniform, thickened cartilaginous cord, while in carcinoma and tuberculosis it, as a rule, has hilly or nodular protuberances. Cancer of the testicle very often extends to the epididymis, and the retroperitoneal glands whose lymphatic vessels emanate from the testis become involved early (these glands are found on both sides of the vertebral column on a level with the kidneys [Albert]).

The lymphatic glands on the corresponding side usually do not become enlarged till the carcinoma of the testis has involved the skin of the scrotum; they then become excessively hypertrophied and transformed into irregular tumors of the size of a walnut or hen's egg. In addition, Ricord calls special attention to the following very important differential signs: Like carcinoma of the breasts or of the eyes, which never occurs in both breasts or both eyes simultaneously, always being limited to one organ at first, so cancer of the testicle is always unilateral, while syphilitic orchitis may occur on both sides at the same time.

The differentiation between gonorrhœal epididymitis and specific inflammation of the testis occasions no difficulties. The painful appearance of the affection in the spermatic cord and epididymis, accompanied by febrile movement, the swelling of the testicle in a few days, and, lastly, the presence of a blennorrhœa, will be more than sufficient to indicate the true nature of the disease.

Hydrocele and hæmatocele are even easier to distinguish from sarcocele syphilitica than the other varieties.

Syphilitic inflammation of the testis, according to H. Zeissl's observations, is a much rarer disease than specific affections of the iris. It hardly occurs once in a hundred syphilitic patients. As a rule, it belongs to the later period of the disease.

The shorter time the disease lasts, and the sooner rational treatment is instituted, the sooner a *restitutio ad integrum* may be expected. Like all the other phenomena of syphilis, specific inflammation of the testis presents relapses. The worst that may be feared from a syphilitic orchitis is the impotence of the patient.

Virchow, who distinguishes a periorchitis and orchitis syphilitica, ascribes the same role to the tunica vaginalis propria testes, in regard to syphilitic affection of the testicle, as the peritoneal envelope of the liver plays in syphilitic hepatitis. Thus he found not only cartilaginous thickening and calcification of the albuginea testes and tunica vaginalis propria, but adhesions between them and complete synechia. Levin found the same morbid alterations on the testis which Virchow described, namely, hyperplastic thickening of the albuginea, the septa, and the membrana propria of the tubuli seminiferi, turges-

cence of the veins that inosculate around the tubuli seminiferi, adhesion of the naturally isolated seminal canals by new hyperplastic tissue, dark-brown pigmentation, and, lastly, fatty degeneration of their epithelial cells. In this manner a considerable number of the seminal canals are destroyed, and in their place fibrous structure is found in the testicle in which no tubuli seminiferi can be seen.

According to Rokitansky, syphilitic inflammation of the testis generally attacks with great violence a few lobules at a time, and gives rise to immense proliferation of the albuginea and the septa, with obliteration of the texture of the gland, so that at last it is transformed into an irregular, hard tumor, with cheesy, tubercular degenerated foci in which accumulations of inspissated pus not infrequently are found. The vas deferens is here obliterated. In very rare cases gummata of the spermatic cord are found, while the corresponding testis is unaffected.

Syphilitic Affections of the Ovaries, Fallopian Tubes, and Uterus.

Virchow has no doubt that there is an oöphoritis syphilitica; still, he is unable to state whether it produces anything more than fibrous induration and its consequences. Klebs, too, is unacquainted with any other lesion in syphilitic women than a chronic inflammatory process of the ovaries, which generally terminates in speedy shrinking of the organ and the formation of circumscribed adhesions. Gummous new growths have been observed by Richet and Lecorché. If both ovaries are affected by syphilis, sterility will be the inevitable result. The so-called colica scortorum, according to Klebs, may sometimes be due to morbid processes in the ovaries.

In regard to the Fallopian tubes, we know of a case described by Bouchard and Lépine, in which, in addition to gummous hepatitis and encephalitis, the tubes were transformed into hypertrophied cords of the thickness of a finger, and contained three soft reddish gummata of the size of a hazelnut on each side.

In regard to specific diseases of the upper section of the uterus, we are unable to speak from personal experience.

Syphilitic Affections of the Mucous Membrane of the Genital Organs of Both Sexes.

An *erythematous redness* occasionally develops upon the internal surface of the prepuce. In consequence of this a more or less severe preputial catarrh is produced, whose secretion macerates the epithelial cells of the inflamed membrane. Syphilitic preputial catarrh is distinguished from the common balanopostheitis by the fact that it appears in a milder form, usually causing no phlegmonous swelling of the prepuce and skin of the penis, no acute inflammation of the dorsal lymphatic vessels of the penis, and no profuse discharge from the fossa coronaria, as in local balanitis. The diagnosis can, however, only be positively decided by the presence of other syphilitic manifestations, especially roseola syphilitica on the glans penis and the skin generally.

Syphilitic *erythema* of the *vulva* occurs even oftener than specific preputial catarrh. Although the affected mucous membrane is not particularly red nor the discharge profuse, still the labia majora and minora are often markedly swollen, and the catarrhal redness spreads into the vagina. Erosions may occur on the mucous membrane of the vulva and vagina similar to those on the prepuce and glans; these erosions are liable to be mistaken by inexperienced physicians for the cause, namely, a soft chancre, instead of the effects of syphilis.

Mucous membrane papules in all their phases alone, or associated with *erythema* of the mucous membrane of the male and female genital organs, occur much more frequently than erythema of these parts. The papules, being covered with a considerable amount of détritus, may readily be mistaken for chancroids or new primary syphilitic infecting chancres. The best test between both these affections is the speedy or slow production of a pustule by inoculation, and the presence or absence of other syphilitic secondary phenomena. Mucous membrane papules in the male are mostly situated in the fossa coronaria, at the aperture of the prepuce and meatus urethræ; in the female, usually at the vulvar orifice. They rarely occur higher up in the vagina or on the cervix; when they occur at the latter place they resemble granulations that result from uterine catarrh.

Gummy tumors are found on the inner or mucous surface of the prepuce, on the mucous membrane of the labia majora and minora, and on the posterior commissure of the vagina, either singly or in groups of three or four. In the latter case they are apt to become confluent, and form semilunar ulcers. They occur less frequently on the cervix, where they are apt to be mistaken for a fibroid or carcinomatous tumor. Now and then they are seen in the form of urethral or peri-urethral infiltration in the male urethra, the caliber of which they are apt to diminish, and as a result of disorganization and sloughing may occasion profuse hæmorrhage and fistulæ of the urethra. Urethral gummata have been found most frequently in the pockets of the fossa navicularis. Gumma of the cervix uteri and of the urethra can only be diagnosticated by the aid of attending syphilitic phenomena (diseases of the bones) and *ex juvantibus* (administration of iodide of potassium).

Gummata on the mucous membrane of the genital organs of both sexes are very often mistaken for a chancroid or Hunterian primary syphilitic lesion. An ulcerating gumma is distinguished from a chancre by the fact that the latter develops and approaches cicatrization much more rapidly than the former, which is always accompanied by other syphilitic manifestations, and that it is sometimes semilunar or sickle-shaped. The differentiation between a gumma of the genital organs and a Hunterian syphilitic primary lesion is only of consequence because the latter is the alpha and the former the omega of the syphilitic disease.

The disorganization that attacks one part of a gumma while healing takes place on the other, and the absence of infiltrated lymphatic glands in the groin, even when the node has existed for a long while, will make a differential diagnosis between it and epithelial cancer quite easy and certain.

Syphilitic Affections of the Corpora Cavernosa Penis.

In several instances we have seen, during the late phases of syphilis, cartilaginous indurations, varying in size from that of a pea to that of a hazel-nut, originate in the corpora cavernosa, in a painless and apyrexial manner. These materially hindered the normal production of erections. The nodes were

mostly situated in the posterior third of the pendulous portion of the penis, and failed to disappear entirely under an anti-specific treatment. We have never seen these nodes undergo suppuration.

Syphilitic Affections of the Breasts.

Sauvages claims to have been one of the first who observed in the mammary glands of syphilitic women cancer-like growths which were made to disappear under mercurial treatment. Richet, Maisonneuve, Hennig, Verneuil, Ambrosoli, and Lang have described gummy tumors in the breasts. The two latter have also met them in males. Lancereaux distinguishes a diffused and a gummous mastitis. He records two cases observed by Ambrosoli, and one by himself, of diffused mastitis in syphilitic women, which were cured by the administration of iodide of potassium. Boeck met with two cases. Both patients had suffered for many years from constitutional syphilis.

Syphilis of the Heart and Blood-Vessels.

As a result of acquired syphilis, simple callous inflammation and gummata develop in the heart in very rare cases. The callous inflammations may affect one or all of the layers of the cardiac muscle, while gumma almost always attacks the myocardium. G. Rosenfeld published a report of two patients who suffered from "asthma syphiliticum," which greatly resembled cardiac asthma. In both cases characteristic evidences of syphilis of the heart were present.

Comparatively rare as affections of the heart in consequence of syphilis are, so frequent are specific diseases of the blood-vessels, and especially of the arteries. The smaller arteries, particularly the cerebral vessels, are most frequently affected. There are, however, reports of many instances of larger arteries affected by syphilis, by M. von Zeissl, Von Langenbeck, Kundrat, and Lancereaux. Heubner devoted particular attention to syphilitic affections of the arteries. *Arteritis syphilitica* occurs either as an independent process or as part of a local specific affection. In the former, grayish-white thickening of the intima and adventitia of the arteries is found either in a circumscribed form, or the vessels are trans-

formed into solid cords of connective tissue. In the second case, the artery lies in a specific diseased mass, and generally all the three coats are involved. Ziegler described this process admirably in the following words: "The intima and the adventitia are apt to be more affected than the media. If the process is still active in the stage of granulation, the thickened intima will also contain a great deal of cellular tissue. Some of the cells are small and round; some, again, larger, spindle-shaped, or stellate, representing various forms of fibroblastema. The same is true of the adventitia. The media is only moderately infiltrated with cells. If the syphilitic affection is of older date; if connective tissue has developed in the domain of the inflammation—the hypertrophied coats of the arteries will contain more fibrous tissue and fewer cells. The media is either in good condition, or it is atrophied and fibrous in places. There is nothing peculiarly specific in the histological process. But it may be said that in the ordinary arteritis of the small vessels, no such enormous accumulation of cellular infiltration occurs as in syphilitic inflammation, and, especially, that the adventitia is not altered to such a degree. The walls of the vessels in syphilis often become markedly hypertrophied, sometimes to such a degree as to occlude the lumen of affected vessels." Ziegler very aptly adds the observation that "no histological criteria of the syphilitic process occur in the blood-vessels. Even the rich proliferation of cells in the adventitia is not pathognomonic, for it is found in the cerebral vessels in other pathological conditions, such as tubercles." Syphilis, then, may be regarded as one of the most frequent causes of arteritis and its effects. By the occlusion of the vessels of an extensive part of an organ, serious alterations may be brought about in it.

Affections of the Brain, Spinal Cord, and Peripheral Nerves, as a Result of Syphilis.

The central nervous system and the peripheral nerves may be the site of morbid products engendered by syphilis, or they may become involved by affections of structures surrounding them (bones, meninges, etc.). As a result of specific exostosis, necrosis, and caries of the bones of the skull, violent pains in

the head, vertigo, jactitation and palsies of the extremities may ensue, followed by hemiplegia and secondary grave lesions of the brain and its membranes. The symptoms which are produced by the exostosis will, of course, vary according to the locality of the brain and spinal cord, which is pressed upon. The meninges may be affected by syphilis even in the earliest stages without any syphilitic affections of the bones being present. In consequence of this meningitis syphilitica, the cerebral membranes become thickened, and hemiplegia, imbecility, and cortical epilepsy may ensue. This kind of extensive thickening of the meninges may terminate in chronic inflammation, and engender a series of symptoms which is very much allied to progressive paralysis of the insane. L. Meyer regards the intimate union of the dura mater with the other membranes and the surface of the brain as especially pathognomonic of the morbid lesion characteristic of syphilitic meningitis.

As shown by Heubner, disease of the basilar arteries, in consequence of syphilis, may be regarded as one of the most frequent causes of cerebral affections. It produces grave disturbances in the circulation in the parts of the brain within the sphere of the affected vessels. Sometimes even large cerebral arteries are found totally obliterated. This condition, and the thrombosis that follows the constriction of the vessels, ultimately result in softening of the brain (encephalitis syphilitica). Gummata, too, are found in the central nervous system, as well as in the peripheral nerves, in the form of large or small reddish, yellowish-brown, or gelatinous, transparent masses, with cheesy deposits on their margins; or nodes, as big as a pea, with cheesy degenerated centers. These products have been only recently recognized as syphilitic gummata, through the researches of Wagner, Förster, Tümpel, and Recklinghausen. They are found in the most variable parts of the brain, in the cortical and white substance, in the corpora quadrigemina and corpus striatum, in the hypophysis cerebri, and also in some of the nerves. Of the cerebral nerves the oculo-motor, the trochlearis, the abducens, the optic and the facial, are especially apt to be affected in consequence of syphilis, and are found infiltrated with the yellowish-gray, gelatinous, trans-

parent, or firm gummatous masses alluded to. On cutting them open a few white points can be seen, which were formerly regarded as undestroyed nerve-fibers, but which, in reality, are nothing more than cheesy deposits.

In regard to the *spinal cord*, those diseases must first be considered which are caused by the syphilitic affection of its envelopes—the vertebræ, and the meninges. As the result of exostoses or inflammatory products developed in the vertebræ, or marked thickening of the meninges, the entire thickness, or only a section of the cord, may become incapable of transmitting impressions, partly as the result of pressure, partly as the result of extension of the inflammation to it, and the well-known phenomena of *compression-myelitis will ensue.* The symptoms which appear in such cases vary greatly, according to the height of the vertebræ or meninges affected, and according as the process attacks the anterior, lateral, or posterior sections of the spinal cord.

In such cases there occur the so-called root-symptoms, i. e., disturbances which originate from pressure upon, or inflammation of, the spinal nerve-roots that take their origin from the diseased places. In the progress of the disease the symptoms of spastic spinal paralysis,* or symptoms of ataxia, or finally, in rare cases, so-called spinal hemiplegia may ensue, according to the part of the cord that is compressed. Later, certain symptoms regularly appear which indicate a partial or complete division of the cord, such as paraplegic conditions, anæsthesia, paralysis of the sphincters, and bed-sores.

In two cases we saw the symptoms of *transverse myelitis* appear at the same time as the secondary phenomena of syphilis; they had resisted all kinds of treatment, but finally were cured by the use of mercury. There are as yet, to our knowledge, no descriptions of undoubted pathological facts published; still, the clinical pictures admit of no other conclusion. In one case, Seeligmüller, by active antispecific treatment, cured a very extensive muscular atrophy in a person suffering from syphilis.

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* This term is used here only for the purpose of describing the symptomatology germane to it, and not in the sense employed by Erb.

Fournier and Erb claim that a causal relation exists between tabes and syphilis that has preceded it. In eighty per cent of the cases which he has observed, Fournier confirmed the coincidence of tabes with syphilis, while Erb cured some and improved others of his cases by antispecific treatment. The question is not yet definitely decided. We are forced, however, to side with Westphal, Leyden, and others, against Fournier and Erb. In some syphilitic cases certain phenomena of serious disease of the spinal cord have been observed, most frequently symptoms of the so-called ascending spinal paralysis (Landry's paralysis), and yet, at the autopsy, not even the microscope could detect any abnormal condition of the cord.

The peripheral nerves very often become diseased in consequence of syphilis. They are affected most frequently by the pressure of exostoses, or the thickened meninges, or by gummata of the meninges or bones. Thickening of the meninges at the base of the brain most frequently produces similar phenomena, and for that reason paralyses of the muscles of the eye are seen so often in syphilitic patients, since the nerves, for a long distance of their peripheral course, run close to the affected part of the meninges, and are involved in diseases of the latter. Paralysis of the muscles of the eye is a complication so common in syphilis that an antispecific treatment should be tried in every case.

In addition to the oculo-motor, abducens, and trochlearis, all the other cerebral nerves may become affected by syphilis. Primary affection of the nerves occurs less frequently in this disease. In the latter, one or more reddish, grayish-red, or yellowish foci form on the nerves, which seem to be much thicker, but sometimes they atrophy to such a degree that only the nerve-sheath remains. The *spinal nerves* have seldom been found affected; usually they show only secondary changes.

The diagnosis of cerebral, spinal, and nervous syphilis is all the more difficult, because in the majority of cases no symptoms of syphilis in other organs—on the mucous membrane or skin—can be discovered. The sudden appearance of a cerebral, spinal, or nerve affection, the age and the history, will form important guides; still, not even the good results obtained

from antispecific treatment will establish the diagnosis beyond a doubt.

Unfortunately, non-specific nervous affections engender symptoms similar to those produced by specific diseases. From the present standpoint of our knowledge we can make the following statement:

In its first period syphilis produces affections of the meninges and the basilar cerebral arteries, while the diseases of the nervous system that come on later sometimes originate in the manner just mentioned, or are due to gummata developing in the nervous substance or in the meninges. In general, the following groups of symptoms are observed with remarkable frequency: Cerebral diseases, consequent upon bone-lesions, manifest themselves by fixed violent *headache* that becomes aggravated *at night.* The painful places are often sensitive to external pressure, and upon those places, or near them, a periosteal gumma is sometimes found. In quite a number of cases *cerebral hemiplegias* ensue, which are usually caused by points of softening that develop in the vicinity of a gumma, or as a result of Heubner's disease of the arteries. These hemiplegias occur either suddenly, like apoplexy, or oftener gradually in successive attacks. The cases belonging to the first variety are almost always the result of arterial disease, and originate partly from thrombosis, partly from embolism (as a result of the conveyance of fibrinous coagula from projecting points on the walls of large cerebral arteries) resulting in sudden plugging of a large vessel. They thus give rise to the clinical phenomena of cerebral emboli. Syphilitic hemiplegias not infrequently vacillate in their course, sometimes get better and then worse; often, indeed, they get well entirely. This is especially true of the apoplectiform cases which have been properly treated by antisyphilitic remedies. In many cases, again, only a moderate degree of improvement, indeed, sometimes not even this much, can be achieved by similar treatment. In such cases we have to deal with plugging of large vessels, which becomes permanent, or with softening in the vicinity of a gumma.

In some cases the manifestations of so-called cortical epilepsy (Jacksonian epilepsy) are observed in syphilitic patients.

This affection, as a rule, is either produced by morbid alterations in the bone (exostoses, gummata) or by specific meningitis. Under such circumstances the processes mentioned may be located in the region of the central convolutions or in their immediate vicinity. We then almost always notice attacks of convulsions, sometimes with, sometimes without, loss of consciousness, but in which the spasms differ from ordinary epilepsy in not attacking the entire muscular system, but only groups of muscles.

It frequently happens that syphilitic patients, after suffering from the phenomena already described, or even if they have not suffered from them, are attacked by peculiar cephalic disturbances which are hardly ever observed in any disease but syphilis. They form the so-called "drunken" conditions that develop in patients suffering from cerebral syphilis. These patients often complain for days and weeks of intense pains, numbness, and confusion in the head, before the picture that will presently be described develops. They are unable to attend to their occupations, especially if any mental effort be necessary, for the least mental strain aggravates the trouble markedly. Having lasted for a while, these symptoms gradually grow worse, unconsciousness supervenes, or the cephalic disturbances rapidly become aggravated, and then change into profound stupor. The patients lie in bed for days with their eyes shut, and can only be awakened from their semi-unconscious condition by being loudly spoken to or shaken. While this condition lasts, they are sometimes perfectly quiet for days; oftener, however, they tug at the bedclothes, play with their genital organs, become restless, and get out of bed. When roused, they will answer slowly and hesitatingly, often manifesting loss of memory and psychical disturbance. During the time that this condition has been developing, other disturbances not infrequently arise, namely, cortical convulsions and hemiplegic phenomena. In quite a number of cases the psychical disturbances become aggravated, maniacal symptoms supervene, or the patient becomes comatose. In the latter event death is the usual termination. In other cases the condition improves, a temporary or permanent cure is achieved, but although the patients regain consciousness, they

are frequently affected with some mental trouble, such as loss of memory. At the post-mortem examination of such cases Heubner usually found morbid meningeal alterations along with the diseased condition of the arteries, and softening of the brain depending upon it.

Lastly, in some cases of syphilis *psychical disturbances* of various kinds have been observed, namely, hypochondria, melancholia, chorea with mania (Wunderlich), and other psychoses.

In regard to the time at which syphilis of the nervous system is likely to appear, it may come on in a very short time after infection. In the majority of cases, however, many years elapse before it manifests itself. The predisposing causes for the development of this form of syphilis, as for all the other grave forms, are: too *early* use of mercury, *incomplete* treatment of the disease, excessive indulgence in wine and sexual intercourse during the treatment, mental worry, and exertion in business.

A permanent cure can only be achieved when the nerve-substance remains unaffected. Improvement takes place rapidly, especially when large doses of mercury and iodide of potassium are employed. Syphilitic diseases of the nerves require a long course of after-treatment to make the cure permanent.

Syphilitic Affections of the Nose.

The three cardinal forms of disease already described occur also in the nose, but with this difference, that erythema may appear on the lower as well as on the upper part of this organ, the papules more in the lower part, and the ulcerating nodes seem to have a preference for the upper and posterior parts of the nasal passages.

Syphilitic erythema of the nasal mucous membrane, or *syphilitic nasal catarrh*, develops with phenomena which are similar to ordinary coryza. It is attended by a sensation of tickling, burning, and dryness of the parts; frequent sneezing soon supervenes, and the visible part of the mucous membrane is reddened. If the catarrh is limited to the anterior part of the mucous membrane the discharge will be only slightly augmented, but if it spreads to the mucous membrane of the

higher nasal regions large quantities of thin fluid are secreted, causing the patient to blow his nose repeatedly. The discharge excoriates the nasal orifices and the adjacent parts. Syphilitic nasal catarrh furnishes no pathognomonic symptoms; its specific character can only be inferred from the accompanying phenomena and the previous history. It may occur either alone or in connection with mucous-membrane papules or nodes. In the first case, under appropriate treatment, and if the patient takes care of himself, it may disappear temporarily or permanently; in the other event, it may spread to the adjacent nasal passages, especially to the lachrymal duct. Syphilitic nasal catarrh, if it is limited to the anterior parts of the mucous membrane, changes the perception of smell very little, while if it involves the superior regions of the nose the patients will suffer constantly from a foul odor, although the watery nasal secretion and the expired air are odorless (*kakosmia subjectiva*). So long as the nasal catarrh is unaccompanied by any other affection, the air passes through the nasal passages unhindered. But if mucous-membrane papules or gummata develop, especially in the higher regions of the nose, the discharge will gradually acquire a muco-purulent character. This thickened nasal discharge readily dries and forms crusts and plugs in the passages of the nose as the result of the action of the air flowing over them, and thus materially impedes respiration.

The *papules* are almost always situated upon the lower part of the nasal mucous membrane, on the margin of the nares, partly on the mucous membrane, and sometimes become so large here as to actually close up the orifices of the nose. We have already stated that mucous-membrane papules, which occur on the mucous membrane of the cartilaginous septum, threaten by their disintegration this part of the septum (*nez de mouton* of the French writers). But whether papules and ulcers in consequence of syphilis occur on the higher parts of the mucous membrane of the nose, or the destruction of the osseous superstructure only takes place through the disorganization of gummata situated at this place, and not from the destruction of mucous-membrane papules, can not be definitely decided, as it is impossible to obtain a view of the

affected parts. The fact that syphilitic affections and destructions of the upper parts of the mucous membrane occur chiefly in consequence of inveterate syphilis, and that the ulcers sometimes found simultaneously on other regions of mucous membrane, or on the common integument likewise, are the result of disorganized gummy tumors, proves conclusively that the malignant specific affection in the upper nasal regions is caused by gummata.

Rhinitis syphilitica ulcerosa; Coryza syphilitica ulcerosa; Ozæna syphilitica. The fetid nose (*la punaisie* of the French writers) sometimes begins with the phenomena of a catarrhal coryza, or it manifests itself soon by a permanent occlusion of the nares. In the course of the disease the Schneiderian membrane secretes a large quantity of yellowish or greenish, thick, purulent matter. The longer the disease lasts, the more ichorous and fetid the discharge becomes, the more repulsive is the odor that is diffused from the nose (*kakosmia objectiva*). The foul odor originates from the decomposition of animal matter, and reminds one of that caused by fetid perspiration of the feet, or putrid flesh. As the discharge grows thicker and more purulent it becomes dry, yellowish-green, sticky and fetid, and crusts and plugs form from the nasal mucus, pus, blood, and decomposed tissue-elements. These close up the nasal passages that are already narrowed by the swelling of the mucous membrane, and render respiration difficult. The patients seek to free these passages by violently blowing the nose often, or to remove the obstruction with the finger, which is generally followed by slight bleeding.

On examining the nose, the mucous membrane is found swollen, and covered with foul-smelling discharge. The ulcers are generally situated at the junction of the cartilaginous with the bony septum, in which situation perforation of the septum most frequently occurs. The opening at first is not bigger than a pea or a bean, and is in the bony part of the septum. The greater the destruction of the latter the less support the bridge of the nose will have; gradually it sinks in, so that a saddle-like depression forms between the tip of the nose and the anterior lower border of the nasal bones.

Ulcers that are situated in the upper regions of the nasal cavity do not become visible till the triangular nasal cartilage, and the skin covering it, have been destroyed by ulceration. Generally there is only one ulcer, sometimes two or three; they are superficial or penetrate to the bone, which soon at this spot becomes carious or necrosed. The necrosis attacks the vomer, the perpendicular plate of the ethmoid, the superior and middle turbinated bones, sometimes the nasal process of the superior maxilla, and the nasal bones. Occasionally the ulcerative process spreads from the septum nasi or the choanes to the bottom of the nasal cavity, and produces perforation of the hard palate, which usually takes place in the median line, and sometimes is so large that the base of the cranium may be lit up through the opening, and if an ulcer happens to be there it will become visible. Moreover, even ulcers which originate in the labyrinth of the ethmoid bone, fostered by the porous nature of its osseous lamellæ, may cause so much destruction that the mouth, nasal, frontal and spheno-palatine cavities may form one large opening, bounded by eroded bony walls, and allowing the movements of the epiglottis to be seen.

Ozæna syphilitica heals under the following conditions: The pain which the patient sometimes suffers on pressure of the nasal process of the superior maxilla disappears; the horrible odor from the nose and the purulent discharge subside; no more particles of bones come away; granulations appear on the ulcer, and cicatrization takes place by a cellulo-fibrous, parchment-like membrane originating on the place where the mucous membrane has been destroyed. The new membrane secretes a yellowish substance resembling cerumen.

Rhinitis ulcerosa develops as a result of acquired and of hereditary syphilis; still, it occurs very rarely in syphilitic infants. A marked degree of deformity of the nose, and consequently of the face, is the effect of ozæna syphilitica. If the disease is situated in the higher regions of the nose, temporary or permanent anosmia may result, the nerves of smell either becoming unimpressionable to odors for a long or short time by the continuous action of the mephitic nasal discharge, or the perception of odors is permanently abolished, because the

mucous membrane which transmits it is destroyed by ulceration and replaced by a dry, parchment-like skin.

Whether rhinitis ulcerosa is a symptom of syphilis or of scrofula can only be approximately settled by taking into consideration the coexisting phenomena and the antecedent conditions. In regard to the concomitant phenomena of ozæna syphilitica hereditaria, in the vast majority of cases it is preceded by ulceration of the soft palate, while in ozæna scrofulosa neither perforation of the hard nor of the soft palate occurs. However, ozæna may also develop secondarily to the extirpation or tearing out of a nasal polypus.

Syphilitic Affection of the Auditory Passages.

According to Gruber, primary syphilitic disease seldom occurs in the external ear. Papular syphilide of the ear and external meatus auditorius differs in no way from that on the skin. In the deeper part of the external ear, and on the tympanum, it is met with in the form of *plaques muqueuses*, which often can only be distinguished from an otitis externa by other signs of syphilis simultaneously present. Exostoses of the bony passages are seldom painful, because they grow very slowly. According to our observations, nodular syphilides of the external ear and meatus occur in both the ulcerating and the non-ulcerating forms; in the former, when it occurs on the auricle, it assumes a lupous character (Fournier). Politzer also met with pustular eruptions.

Of all the sections of the ear, the middle ear, owing to the frequency with which specific diseases occur in the nasal and faucial structures, is most frequently affected by syphilis. In the lining membrane of the tympanum, especially in the mucous membrane covering the membrana tympani, syphilitic ulceration very frequently causes severe pains, which, in contradistinction to ordinary otitis media, do not abate even after perforation of the tympanic membrane has taken place. But, so long as the morbid process is confined to the Eustachian tube, the patients complain of symptoms that specially belong to affections of the auditory nerve. According to Löwenberg, infiltrations and proliferations may occlude the faucial aperture of the tube, and, if followed by suppuration, occasion fearful

destruction and retracting scars, that will close up the opening. Schwartze regards the following phenomena as characteristic of the specific nature of chronic catarrh of the ear: The affection is always bilateral, and does not begin for some months after other syphilitic phenomena have appeared. The nocturnal exacerbations of the osteocopic pains in the temples, the rapidly increasing impairment of hearing, and, lastly, premature diminution of cephalic bone-conduction (labyrinth syphilis), are additional confirmatory evidences of the specific foundation of the disease. The extension of the suppurative process from the lining membrane of the mastoid cells externally to the periosteum of the mastoid process frequently occurs in syphilitic patients, without perforation of the tympanum—i. e., without preceding otorrhœa. Hyperplasiæ (inflammatory hypertrophy) may be observed on any part of the middle ear. Very severe inflammatory processes in the mucous membrane of the middle ear are usually accompanied by hyperæmia of the tissues of the labyrinth, which causes extravasation of blood, and in this manner engenders *sudden* and usually incurable deafness.

Syphilitic Affections of the Eye.

By Professor Ludwig Mauthner.

Iritis Syphilitica.

Syphilis *per se* may undoubtedly occasion iritis, and it is equally unquestionable that, of all the causes of iritis, syphilis heads the list. We may unhesitatingly maintain that at least half, if not a larger proportion, of all the inflammations of the iris, is due to syphilis; indeed, there are medical writers who doubt the occurrence of rheumatic iritis, and who are disposed to regard all instances of iritis rheumatica as syphilitic.

Iritis not infrequently occurs in the early stages of syphilis, sometimes even as its very first lesion, and in that case displays its real character by the visible gummous nodes that form in the iris. As these patients were positively treated without mercury, we have the best proof that the gummata are not the effects of mercurialization. Likewise, the fact that, although iritis may appear in the first stage of syphilis, yet is also apt to supervene in the later stages, along with

gummata, proves that, strictly speaking, there are no so-called secondary or tertiary manifestations of the disease.

Syphilitic iritis scarcely ever attacks both eyes simultaneously; generally, one eye is affected first, and the other afterward. In regard to the symptomatology, it may be stated, first of all, that the symptoms of specific iritis can not be distinguished, in the majority of cases, from the idiopathic variety. Like the latter, it may develop in an acute, subacute, or chronic form.

An iritis that has already developed often remains for a long time at its acme. If the affection was ushered in by violent pains, that radiated into the eyebrow, into the forehead, often over the entire half of the corresponding side of the head, and if the symptoms peculiar to iritis (marked injection around the cornea, opacity of the anterior surface of the iris, change of its color, and blurring of the normal fibers, but especially adhesions of the pupillary border of the iris to the anterior capsule of the lens), accompanied by photophobia, and lachrymation have developed quickly, the inflammation will be very severe, and may last an unreasonably long while, the pains continue undiminished, exacerbating at night, and the inflammatory product, in the form of a membrane covering the pupil, and of small nodes situated on the posterior wall of the cornea (Descemet's membrane), constantly becomes more and more noticeable.

In other cases, the disease develops less violently; in still others, there is only a diminution of the power of vision that induces the patient to seek medical relief. In these cases iritis has crept on insidiously, the posterior synechia, the pupillary membrane, or little nodes on Descemet's membrane, opposite the pupil, that resulted from the disease, have materially diminished the power of vision.

Since the forms of iritis mentioned, as they actually originate from syphilis, are not in the least characteristic, and since we are unable, by merely examining the eye, to recognize the syphilitic basis of the affection, it is of the utmost importance for the oculist, in every case of inflammation of the iris, to seek for evidences of syphilis—but not in the loose manner in which this is usually done.

However, there is *one* form of syphilitic iritis which proclaims itself as such, namely, *iritis gummosa*, but which scarcely amounts to one fourth of all the cases of specific iritis. It is characterized by minute granules, of bright or deep yellow (in dark irides, reddish-brown or black) color, which develop on the pupillary or ciliary border, or on the plane of the iris; they are generally situated in the parenchyma of the latter, project with the smooth, semicircular surface into the anterior chamber of the eye, and not infrequently a fine network of vessels is woven around them. They vary in size and number. There may be several small ones (of the size of a pin's head and larger) on various places of the iris, in which case the pupillary border will be surrounded by them, like a wreath, or only two or three little nodes are seen. However, these very isolated granules are the ones that sometimes display such a wonderful tendency to proliferate, that they subsequently almost completely fill up the anterior chamber. When these minute nodes exist, the symptoms of iritis, as a rule, will be severe; sometimes, however, only a section of the iris, in which the granules are found, is inflamed, or there are no actual inflammatory phenomena at all. The microscopical examination of these nodes shows the presence of large numbers of small cellular elements, such as constitute gummata in general and granulation-tissue. The presence of gummata in iritis proves conclusively that syphilis is the primary disease. That so many writers should deem iritis gummosa to have so few characteristic symptoms, must be due to the fact that, in some cases, the clinical history was not investigated with that thoroughness that is often necessary to confirm the presence of syphilis.

In general, it is quite easy to diagnose the gumma-nodes. But when, in iritis, a large yellowish-gray lump of inflammatory product is deposited on the periphery of Descemet's membrane, it may become impossible to distinguish it from a gumma situated in the structures of the iris. In that case, nothing less than opening the anterior chamber of the eye will solve the question, for the deposited matter may then be removed. On the other hand, that tumor, which is observed without, but also with symptoms of iritis, and is known as granuloma iridis, and

which, both in its external appearance and histological connections, agrees entirely with gumma, will be less likely to deceive us in diagnosis. Aside from its extreme rarity, and with the exception of another form of node, which may be looked upon as a growth of traumatic granulations, it can be regarded as nothing else than a true gumma, originating in consequence of syphilis, especially the hereditary variety. Equally unimportant, in regard to the diagnosis of gumma, is true tuberculosis of the iris, and the circumstance that, in acute adenitis of non-syphilitic origin, small, roundish tumors, of reddish color and feeble consistency, are said to occur in iritis.

Lately, a peculiar, gelatinous exudation, resembling in outward appearance the dislocated lens, has been seen in the anterior chamber, in cases of iritis. It accumulates with extreme rapidity and in large quantities, and may disappear with equal rapidity. The connection that was formerly claimed to exist between this kind of exudation and syphilis can not, however, be maintained.

The *terminations* of iritis syphilitica, in the main, do not differ from those of the idiopathic or rheumatic variety. Under appropriate treatment it may be cured entirely. Sometimes this favorable termination ensues even spontaneously. It may leave some synechiæ, with or without a pupillary membrane. It may cause total closure of the pupil by annular posterior synechiæ, which, since the persistence of synechiæ favors the tendency of the inflammation to relapse, often gives rise to secondary glaucoma, and is followed by total blindness.

In regard to gummata, it is necessary to observe that the smaller kinds of these structures gradually disappear, and leave nothing more than a colorless spot in the parenchyma of the iris. In extremely rare cases, small gummata have also been seen to undergo purulent degeneration. A large gumma, especially if situated on the ciliary border of the iris, may destroy the eye by attacking the ciliary body. The bulb in that case shrinks and becomes totally atrophied. Still, even a very large gumma, if it is confined to the iris, may speedily and completely disappear, without leaving any injurious effects.

The prognosis of syphilitic iritis should always be given with caution—with much greater caution than in idiopathic inflammation of the iris. It is necessary to bear in mind that the inflammatory phenomena may remain for an unusually long time at their height; that an implication of the other eye is at least to be apprehended; and that the affection has a strong tendency to relapse. Thus, it may happen that, although the patient is situated under the most favorable circumstances, and is undergoing inunction-treatment to the point of salivation, the iritis that was already cured relapses with terrible violence, or the second eye is attacked by the disease in the form of grave, gummous iritis; that the spreading of the morbid processes from the iris to the ciliary body and choroid occurs oftener than in any other form of iritis; and, lastly, that the inflammatory product becomes organized into synechial and pupillary membranes with great rapidity, and that even an early treatment often will accomplish no complete cure. Indeed, this may even be true of the other eye, which became involved under the observation of the physician.

The treatment of iritis syphilitica requires not only local but also general measures, directed against the primary disease. The local treatment, however, differs in no respect from that of rheumatic iritis. A few drops of a solution of atropine (atropia sulph., 0·05 [gr. j], aq. destil., 5·00 [℈iv] should be dropped into the conjunctival sac, if the inflammation be severe, every two hours; if not, at longer intervals; and cataplasms of pulv. semini lini should be applied to the eyes. This is very agreeable to the patient, and assuages the pains; if they fulfill these ends, it will be necessary to apply them day and night. If the pupil does not dilate under this treatment and the pains do not abate materially, six or eight leeches should be applied to the temples, and a subcutaneous injection of morphine administered to the patient in the evening. The action of the latter may be prolonged by subsequently giving him a dose of chloral hydrate. If the iritis is apparently cured, and if no injection of the ciliary body can be seen in the *daytime*, the cornea should be carefully examined when the patient wakes in the morning, to see whether any halo is present around it. So long as this condition continues, it will be neces-

sary to use the atropine solution, in order, if possible, to guard against a relapse.

If gumma nodes develop in the course of an iritis syphilitica, the physician will feel justified in subjecting the patient to mercurial treatment. There is no local, special treatment that can be recommended against the gummata: because, on the one hand, the small ones are not dangerous to the eye; on the other hand, even a large one may disappear without leaving any trace; and attempts made to obviate any impending danger to the eye from a large node by removing it (excising it and pieces of iris) have not been followed by satisfactory results.

During the time the severe febrile phenomena last, it will be well to keep the patient in a dark room, in bed; the eye (if no cataplasms are employed) should be covered with a linen bandage and protected by a green shield; the patient's diet and the movements from his bowels should be regulated.

If iritis is ushered in under moderate or no symptoms of irritation, the local application of atropine, protection of the eye against glaring light by the aid of smoky spectacles, and avoiding other injurious influences, will suffice. A mercurial treatment, however, is perfectly justifiable.

The treatment of those conditions that may remain after the iritis has entirely disappeared belongs to the special domain of the oculist.

Affections of the Ciliary Body, the Choroid, and Vitreous Humor.

The ciliary body scarcely ever becomes affected independently unless a primary gumma forms in it. Yet the eye need not necessarily be destroyed by the latter condition; on the contrary, gummata of the ciliary body have been seen to disappear, at any rate, under mercurial treatment, without leaving any injurious effects in the eye.

It is scarcely possible for the ciliary body and choroid to become affected by the extension of the inflammation from the iris. *Acute irido-choroiditis syphilitica*, which may supervene, it is true, in some exceptionally rare cases, attended by the formation of gumma in the deeper parts of the eye, but,

as a rule, showing nothing specific, manifests itself in the following manner: A marked sensitiveness of the ciliary body, and remarkable diminution of the tension of the eye-bulb; further, a diminution of sight that in no way corresponds to the visible opacity of the media; although the pupil is still partly permeable, yet no reflex can be obtained by the ophthalmoscope from the fundus of the eye, or the opacities of the vitreous humor present are seen as undulating black masses in the dim field of vision. These phenomena usually supervene upon a violent iritis. Acute inflammation of the irido-choroid structures is a very destructive disease, and when left to itself will frequently result in atrophy of the eye.

In another series of cases of iritis, the attention of the physician will be attracted principally by a loss of sight disproportionate to a complication which he will recognize as opacity of the vitreous humor. If the choroid is free from morbid alterations (of which we can only convince ourselves, as a rule, after the inflammation has entirely disappeared, and an iridectomy has been performed), we are justified in assuming that the opacity of the vitreous humor is not an expression of a choroiditis, but that it is an independent inflammation of the vitreous body—a *hyalitis*. This kind of hyalitis may develop in the course of syphilis even without iritis. Still, the fact that alterations of the choroid frequently appear later, shows conclusively that it was a case of latent choroiditis (serosa).

The most remarkable specific affection of the choroid, but which can only be detected by the aid of the ophthalmoscopic mirror, is *choroiditis disseminata*, of which, in syphilis, the small macular form is most frequently seen. However, it does not follow that the latter is seen exclusively, or that the large macular form does not occur in syphilis. Behind the retinal vessels, in the fundus of the eye, there are seen numerous very small, roundish, oval or angular, yellowish or bluish-white, inflammatory deposits, surrounded by pigment-cells, especially in the equator bulbi. Toward the posterior pole of the eye, a few large deposits of exudation, resulting from the fusion of a number of small ones, may be seen, or the disease is limited to the circumference of the eye. It may also happen that

bright, pathological foci in the fundus of the eye are entirely absent, and in their place the fundus is seen covered with irregular clumps, or regular masses of black pigment. Owing to the fact that the discolorations in syphilitic choroiditis, as in any other kind of inflammation of the retina, are capable of assuming figures that strikingly resemble the typical pigment degeneration of the retina (so-called retinitis pigmentosa), the error has sprung up quite recently of assuming that retinitis pigmentosa is a manifestation of hereditary syphilis, or a result of constitutional syphilis. In choroiditis disseminata the sight is impaired to a variable extent, according to the degree in which the external layers of the retina are involved in the inflammatory process of the choroid membrane.

In the treatment of syphilitic inflammation of the choroid, mercurial preparations will be required all the more because the best results are derived from their use, even in the non-specific form of the disease. If the acute irido-choroiditis is once subjugated, the sight will materially improve. If relapses of opacities of the vitreous humor and exacerbations of choroiditis disseminata occur, mercury will again be required in the treatment.

Inflammation of the Retina and Optic Nerve.

Syphilitic choroiditis, like syphilitic iritis, may be combined with *retinitis;* the latter, however, also occurs alone, and as a rule in the later stages of syphilis. Specific retinitis presents no pathognomonic lesions whatever; still, it can not be denied that the symptoms of inflammation in the syphilitic form generally do not assume that degree of intensity that they do in other kinds of retinitis. As a rule, there are found merely light-gray nebular opacities that center around the point of entrance of the optic nerve, cover its margins more or less, and spread in all directions; sometimes they are sharply outlined, and even at the height of the disease are very slight. As the retinal vascular symptoms (varicosities and dilatations of the veins) are but slightly marked in most instances, the entire appearance of the retina might be explained by the tension of the delicate membrane of the vitreous body in front of it; but, although a delicate, dust-like opacity is described as an

early, rarely absent, symptom of retinitis syphilitica, still the marked diminution of sight attended by annular defect of vision surrounding the point of fixation, and other striking disturbances of the functions of the retina, point to the presence of grave retinal disease. In other cases retinitis, being attended by striking alterations of the structures and vessels of the retina, is, *per se*, easy to diagnose, but its syphilitic foundation can only be confirmed by the aid of other manifestations.

As a special form of retinitis that has been met with, combined with syphilis, the *central relapsing variety* may be mentioned here, which manifests itself by suddenly appearing and disappearing, and reappearing again in the same manner, as opacities in the domain of the yellow spot, attended with corresponding disturbances of vision.

If gumma nodes develop in the brain in the course of syphilis, or the optic nerve undergoes gummous degeneration, as has been observed several times, the presence of cerebral syphilis, or of syphilis of the optic nerve, may also declare itself by the occurrence of *retinitis optica*—i. e., by swelling of the intraocular portion of the nerve of vision. This form of neuritis is not in the least specific; it only points to the possibility of the presence of a cerebral tumor, which may indeed be a gumma. On the other hand, the use of the ophthalmoscope should never be neglected when the presence of syphilis is suspected, because neuritis may come on with very slight disturbances of vision, the patient complaining of no fault of his visual organ, and yet the presence of a neuritis will materially support the diagnosis of cerebral syphilis. After all, neuritis and atrophy of the optic nerve occur in syphilis, also amblyopia and amaurosis, without any pathological lesion—without any coexisting signs of cerebral disease.

The local treatment of retinitis and neuritis syphilitica is limited to keeping off glaring and all kinds of hurtful light; the general treatment is the same as in cerebral syphilis.

Affections of the Cornea, Conjunctiva, and of the Eyelids.

Both hereditary and constitutional syphilis find a fertile field in the cornea—above all, in the form of *keratitis paren-*

chymatosa (diffusa, interstitialis, profunda). According to the views of the English writers, this is the expression of hereditary syphilis, and simultaneously is said to be present with other morbid processes depending upon the hereditary disease; for instance, in almost all cases with a peculiar conformation of the teeth (Hutchinson), and in many cases with deafness. Still, we may merely assert that parenchymatous keratitis is perhaps the only affection that in most cases is caused by extraocular causes; that it especially supervenes in badly nourished constitutions, and thus occurs alike in chlorotic or scrofulous individuals, or in those living in misery and want, as well as in syphilis.

True *keratitis punctata*, which is characterized by the appearance of a dim, grayish spot, as big as a pin's head, in the various strata of the substantia propria corneæ, has perhaps the closest connection with syphilis, but is such a great rarity that it only deserves to be mentioned.

Occasionally we meet in syphilitic persons an obstinate conjunctival catarrh that sometimes precedes iritis for a long time. Yet it can not be positively asserted that the catarrh, *per se*, was produced by syphilis. Both *hard* and *soft chancres*, and *secondary gummata*, are found on the conjunctiva, but all of them are exceedingly rare.

In regard to affections of the eyelids, the most important is syphilitic *inflammation of the tarsal cartilages*. Rosy spots or maculæ are seen on the external skin of the eyelid; they gradually develop into roundish granules, and when these undergo degeneration ulcers originate. Ulcers upon the adjacent soft parts may also spread to the eyelids. The latter may finally become perforated, followed by the formation of scars, which cause them to become everted, resulting in cicatricial disfigurement and distortion.

Affections of the Orbits, Lachrymal Sac, and of the Muscles.

Syphilis may occasion caries, necrosis, and exostosis of the orbital bones; specific ulcers upon the mucous membrane of the lachrymal duct, like caries and necrosis of the surrounding bony structures, may produce marked constriction of the duct,

and thus establish a chronic lachrymal disease. Specific inflammation of the muscles of the eye may possibly result in paresis of the latter, but as a rule this lesion depends upon syphilitic affection of the brain, the affected cerebral nerves being compressed at the base of the brain, or involved in the morbid process. Here we have isolated pareses or paralyses; still, palsy has been observed in almost all the muscles of both eyes. Not infrequently, especially in paralysis of the muscles of the eye caused by syphilis, it is possible to confirm the simultaneous presence of partial or extensive anæsthesia of the skin of the face; and it can not be denied that the coexistence of paralysis of the muscles of the eye, and of the parts to which the trigeminus is distributed, points to syphilis as the primary cause of the disease.

Syphilitic Affection of the Bones and their Envelopes.

Next to the common integument and the mucous membrane, the bones are most frequently subjected to syphilitic affections. However, syphilitic affections of the bones do not appear till the morbid alterations have intensely and extensively involved the skin and mucous membranes. Clinical experience has shown that superficial syphilitic diseases of the skin, roseola, and papules, go hand in hand with periosteal affections; on the other hand, the deep and suppurative lesions of the skin, such as ecthyma and rupia, are associated with deeper specific parenchymatous bone-diseases (sclerosis and caries profunda), the gummous affections of the skin or mucous membrane, with gummata on the skeleton.

With the exception of inflammation of the iris, no specific lesion of any structure manifests itself by such violent pains as affections of the periosteum; still, the pains vary according as the bones are involved from the beginning of the syphilitic disease or later in its course.

The great majority of syphilitic patients complain at the beginning of the disease, at the time of the eruptive fever, of tearing, dragging pains, which appear here and there, disappear entirely, and then reappear again, which emanate from the periosteum of some of the bones, mostly of the head, shoulder, and knee-joints, and especially the cristæ tibiæ.

The painful places are neither swollen, nor is their temperature increased; pressure upon them not only does not increase the pain, but generally causes it to disappear. The pains, therefore, seem to be purely neuralgic or rheumatoid in character.

The pains which occur later in the course of inveterate cases of syphilis, as a rule, are more intense, and do not travel from one place to another, because they are due to an exudative lesion between the periosteum and bone, or to inflammation of the endosteum of the bone cancelli. The patients generally describe the pain as deep, boring (*dolores osteocopi, terebrantes*); some maintain that they feel as if the bone were being sawed through; others, again, as if the bone were compressed in a vise. Syphilitic pains in the bones are particularly severe at midnight, disappearing toward morning, attended by profuse perspiration; hence, they have also been called *dolores nocturni*. Ricord denies that an astronomical period exercises any influence over them, and asserts that he has found that the exacerbations of the pain are only caused by the warmth of the bed. Bäumler believes that syphilitic pains in the bones are superinduced by nocturnal febrile exacerbations, the action of the heightened temperature causing the vessels of the periphery of the body, the periosteum, and the bones, to become dilated, a larger flow of blood ensues, thus resulting in swelling of some parts of the bones. According to our experience, the nightly exacerbations of pain are not felt by all patients; sometimes the pain in the affected bone is present day and night; sometimes, again, it increases as twilight sets in. The latter is always the case when the inflammatory deposits of the periosteum or medullary spaces undergo suppuration. Alternately abating and exacerbating, the pain lasts as long as the exudation continues; it subsides when the inflammatory product becomes ossified, but still continues when suppuration and carious degeneration ensue. The cause of the pain in periostitis is the tension of the periosteum by the exudation that is poured out between it and the bone; in ostitis, by the eccentric dilatation of the medullary spaces, which are surrounded by unyielding bone by the new deposit that takes place in them.

Syphilitic Inflammation of the Periosteum; Periostitis Syphilitica.

Attended by more or less violent pain, a tumor forms on some parts of the affected bone. If the finger is gently passed over it, the pain is increased; while, if the pressure is more concentrated, it is sometimes diminished. The periosteal swelling consists of a gelatinous, synovial-like, gummous exudation, which, examined microscopically, proves to be jelly-like embryonal connective tissue. This periosteal inflammatory product is either absorbed or tranformed into pus and ichor—periostitis suppurativa sive exulcerativa—or, in consequence of a timely deposit of sufficient salts of lime, it becomes ossified—ossifying syphilitic periostitis. In the latter case, a porous bony thickening forms, which, on account of its external resemblance to tufa, is also called *tophus*. But, if the syphilis has attained a high degree, the embryonal connective tissue is transformed into a gumma or syphiloma—*gummous periostitis.*

Ossifying periostitis occurs in a diffuse form or in the shape of a smooth, roundish, plano-convex, circumscribed, elastic swelling. The skin over it generally remains unaffected in its texture, and may be readily displaced. These elastic swellings sometimes become very large, but, notwithstanding their size, may disappear without leaving a trace behind, so long as they are not ossified. In many cases, after absorption has taken place, the bone retains a cartilaginous thickening, due to ossification of the deeper layers of the periosteum. Ossification usually ensues only in persons of robust constitution, especially if the periosteal swellings developed in an acute manner. If the periostitis runs a chronic course, ossification takes place very slowly. It manifests itself by the formation of osteophytes, exostosis, and hyperostosis. The new deposits of bony matter, at least at first, are not intimately and firmly united to the subjacent bone. The neoplasm lies close to the affected bone; gradually the part of the bone in contact with it likewise becomes attacked by an adhesive inflammation, on account of which the ossific matter of the new deposit and that of the bone blend together.

Most of these osteophytes, especially upon the internal or external surfaces of the bones of the skull, have a smooth, plano-convex shape. Such tumors were described by Rokitansky as ebony-like exostoses, planted externally upon the superficial surface of the bone. They have a well-marked border, and often are surrounded by a groove; in texture, they are more dense at the places of contact with the bone, which, however, also appear to be indurated.

Ulcerating periostitis usually announces itself by a circumscribed, painful swelling, which fluctuates from the very beginning. The skin over it soon becomes red, and fuses with the tumor, forming one common swelling. The pus accumulates between the periosteum and the bone, in such a manner that the former is raised up for a considerable extent from the bone, and the latter, being thus deprived of its envelope, loses its source of nutrition, in consequence of which its upper surface degenerates into a carious or necrosed condition. Furthermore, the contiguous soft parts may become involved in the suppurative process. There then originates a large, spreading, ichorous, phagedenic ulcer of the skin, that extends down to the bone. The pus that has formed under the periosteum may, however, also become inspissated into a yellowish, caseous mass, whereby the periosteal inflammatory product may resemble tubercular deposit. Exfoliation of necrotic pieces of bone occurs very rarely. Finally, after the ulcer of the bone has lasted a long while, the wound closes by the formation of new connective tissue and retraction of the skin. We have never been able to demonstrate the occurrence of suppuration of the inflammatory deposits in the parietal layers of the endocranium.

Gummous periostitis furnishes, during life, very few diagnostic points. It is not possible to assert positively whether the tumor, that has its starting-point in the periosteum, and is covered with normal integument, is a growing tophus or a gumma. Indeed, even the well-marked, bony hardness of the new growth is no proof against the presence of a syphiloma, because, as Virchow maintains, it is a question whether a gumma of the periosteum may not become ossified. If we bear in mind that even the central part of a gumma that origi-

nates from the periosteum may undergo degeneration, and the contiguous bone must afterward become carious or necrosed, it is clear that a large number of cases of gummous periostitis should be recorded as ulcerating periostitis. Hence, during life, it is only possible to assert, with approximate certainty, after the periosteal swelling has disappeared without suppuration, and a depression is felt through the skin in its place, that a gumma was absorbed at this point, and that the form of bone lesion occurred here which Bertrandi and Virchow have designated as *caries sicca*, or *inflammatory atrophy of the cortex of the bone.* There are authentic descriptions by Virchow and others which prove, beyond a doubt, that papillary structures originating from the periosteum, and consisting of a transparent, gelatinous, yellowish-gray substance grow into contiguous bones, and whenever the periosteum is torn off these neoplasms are pulled out of the openings in the bones. The microscopical examination of these papillæ shows that they are real gummata. The gumma that grows into the bone gives rise to two apparently contrary processes. While the osseous substance disappears from the central point of the affected part of the bone, in consequence of rarefaction or atrophy, and a funnel-shaped depression is thereby produced, new bone substance is deposited on the circumference of this depression, upon the surface surrounding it, and in the diploë contiguous to the affected places, which becomes indurated or eburnated. This hyperostosis forms around the depression a slightly irregular, hilly wall, which gradually grows lower and smoother till it merges completely into the adjacent normal parts. There are frequently cicatricial retractions in the skin over the affected bony depressions.

The eroding gummata of the bones occur not only on the periosteum of the long tubular and flat bones, but also on the periosteal layers of the dura mater and on the medullary membrane. They are met with singly or multiple, in the latter case always in groups. Deposits of these gummata are sometimes found on the internal and external bones of the skull. Virchow has seen several times an external gumma-node corresponding with one internally, and in one case the bone became perforated.

Ostitis Syphilitica.

In consequence of syphilis, the medullary spaces of the bones may be the site of inflammatory deposits, like the gelatinous new growths between the periosteum and bone in periostitis, the fine connective-tissue meshes that contain fat becoming generating places for the new growth. So long as the neoplastic connective tissue retains the gelatinous composition, so long is the affected part of the bone soft, and easily cut with a knife. If absorption sets in early, the diseased bone again becomes perfectly normal; if not, the condition of the part gradually becomes altered. The affected part becomes sclerotic, like ivory, *eburnated*, or it degenerates into a state of *osteoporosis*, or is destroyed by *suppuration* (caries profunda, according to Rokitansky). The favorable termination is in osteo-sclerosis, in which the affected bone is both thicker and heavier, but not otherwise impaired. The case is altogether different with osteo-porotic bone; this is soft, can be bent, and has a markedly waxy color. When it undergoes suppuration, the cells and the spaces in the meshes are dilated and filled with ichor. The bone is discolored, brittle, or livid, if the granulations exuberate in the spaces; it resembles a putrid piece of flesh, and is readily broken down by the pressure of the finger, and may be cut with the knife. It has lost its firm, cortical substance, and is permeated throughout with proliferating granulations. In other cases, a new bone has originated from the osseous cortical substance, which goes on growing, while internally it continues to suppurate, producing an appearance as if the carious bone had become inflated. Occasionally, a circumscribed collection of ichorous matter takes place; it is sometimes surrounded by a hypertrophied osseous substance, and is lined internally by a layer of rich vascular granulations. The process of ulcerative destruction consists in the fusion of the bone-substance with the walls of the medullary spaces and with the bone-cells, which become dilated and filled with a mass of finely granular détritus. The fusion of the intercellular substance goes on while the salts of lime are being diminished. The marrow undergoes degeneration into a fatty ichor, as a result of the destruction of its fatty cells.

Adjoining the suppurative process of the bone, the soft parts are always affected to some extent with inflammation, which terminates partly in new hyperplastic deposits, and partly in purulent infiltration. The periosteum becomes hypertrophied and united to the adjacent connective-tissue proliferations, forming a gelatinous or fibrous bulbous mass, infiltrated by purulent deposits, in which the muscles are agglutinated. The latter grow pale and are destroyed. According to circumstances, the purulent collection, in or on the bone, will burst externally, sometimes a large ulcer then results, or one or more straight or crooked, simple or ramifying long canals (fistulæ, sinuses) form, in the vicinity or at a distance, whose openings are generally surrounded by a rampart of granulations, or they burrow their way into a joint. The granulations have a characteristic appearance, resembling a hen's anus, and always indicate the presence of dead bone.

Gummata occur not infrequently in the medullary spaces. Lebert, Rouget, Gosselin, Follin, Virchow, and Chiari have seen them in this locality. Thus, necrosis of the bones of the skull, in the course of constitutional syphilis, generates peculiarities which led Virchow to assume that this necrosis belongs to the gummous form. The necrosis here goes on from within outward; the dead piece of bone begins to detach itself by the formation of an indented line of demarkation from the still living indurated bone, the borders of the latter frequently projecting over the necrosed piece. Sometimes several points of necrosis are met with near each other or at remote places; in the former case they coalesce and cause terrible destruction. On its external surface the dead piece of bone has large holes, which coalesce inwardly, looking very much as if the gumma had originated within it; but the inclosing necrotic substance is at the same time indurated and heavy, presenting a most peculiar appearance.

Chiari has observed gummata in the medullary canal of long bones, which, during life, seldom produced any clinical symptoms. They may be absorbed or cause induration of the osseous tissues or central necrosis. Syphilitic affections of the bones not infrequently result in spontaneous fractures.

Cicatrization of Syphilitic Ulcers of the Bones.

Rokitansky and Virchow state that a syphilitic osseous scar possesses remarkable peculiarities. According to the former, the parts surrounding an ulcer of the bone display not infrequently induration combined with hyperostosis. Virchow describes the syphilitic osseous cicatrices in the following words: "Every specific scar in a bone is characterized by a lack of production of bone-substance in its center, while a superfluity forms at its circumference." If the bone, says Virchow further, is totally destroyed at one place, as is often the case in the bones of the palate, nasal septum, or of the skull, nothing, or at least no ossific matter, will form in its place. Nowhere is this so strikingly to be seen as on the skull, where the orifice, on its inner surface, is covered with a membrane so capable of producing ossification as the dura mater. The latter soon thickens at the site of perforation, and when the necrotic piece of bone is removed a scar forms, on whose borders the external skin, and the soft parts covering the skull, the bone, and the dura mater are fused together into a common mass, and afterward appears as a white, anæmic, dense, thickened substance. The longer it lasts the denser and shorter it grows, so that the natural arching of the skull at this point disappears, the entire scar gradually becoming flattened. If the entire thickness of the bone is not affected with necrosis, an irregular depression will result after the dead piece of bone has exfoliated. But little newly formed cicatricial tissue is found later in this depression, and the loss of substance here is hardly ever replaced by regenerative processes. The only sign of regeneration is found at the margins. These, which originally were very abrupt, gradually become thinner, and subsequently, by the interposition of a bony rind, usually are transformed into a space that is permeated by grooves and fissures. As induration and hyperostosis of the surrounding bony parts regularly take place here, the places resemble very much those that have been produced by inflammatory atrophy without necrosis or suppuration.

Site and Effects of Syphilitic Periostitis and Ostitis.

Any part of the skeleton may become affected by syphilis. The cranium, the palate-bones, the clavicles, the sternum, and the tibiæ are, however, most frequently diseased, probably because these parts are more liable to be affected by external causes, such as changes of temperature, the air, and especially mechanical injuries. Bones with many angles, such as the phalanges, the metacarpal and metatarsal, are very rarely affected. Those enlargements of the bones of the pelvis, which at the time of Kilian were described as acantho-pelvis or thorn-pelvis, may perhaps sometimes originate from syphilis. Periostitis and osteomyelitis may occur in the bones that have been mentioned. The diaphyses alone of the tubular bones are almost exclusively attacked; the epiphyses become affected in exceptional cases only, especially in congenital syphilis. The terminations of periostitis and ostitis vary in different bones. Thus ossifying, ulcerating, and gummous periostitis, osteosclerosis, osteoporosis, caries, and necrosis, occur on the bones of the skull, while the intra-maxillary portion of the superior maxilla is pre-eminently liable to suffer from suppurative ostitis. Specific caries and necrosis seldom originate in the inferior maxilla; frequently, however, ossifying or indurating periostitis develops here.

Some of the nerve or vascular trunks may be compressed by osteophytes, whereby neuralgias, palsies, and disturbances of circulation will be produced. Thus, we saw the ischiatic nerve compressed by an exostosis on the great sacro-ischiatic foramen, and the corresponding limb was paralyzed. Paralysis of the facial nerve and of the corresponding side of the face may be produced by an osteophyte near the stylo-mastoid process. Again, an exostosis or a gumma on the sella turcica, on which the optic commissure rests, will compress the nerve of vision to such a degree that the patient may become totally blind. Osteophytes and exostoses in the orbit of the eye may give rise to exophthalmus. By ossification of the internal auditory meatus permanent deafness may ensue. Ossific hypertrophies on the inner plate of the cranium may, by pressure on the brain, produce convulsions, epileptic attacks, and soft-

ening of the brain. If a gumma over the frontal sinus undergoes softening, or if a large or small piece of the cranium at this place becomes necrotic, fatal hæmorrhage, by opening into the superior longitudinal sinus, or meningitis may result. Caries of the mastoid process may perforate into the tympanic cavity, thereby causing detachment and removal of the ossicles of the ear, and this will be followed by deafness.

Differential Diagnosis of Affections of the Bones produced by Syphilis.

Many of the extreme opponents of the mercurial treatment maintain that all the affections of the bones occurring in syphilitic persons are brought about by the use of *mercury*, and that syphilis, *per se*, is not capable of producing either ostitis or periostitis. Still others, who do not deny the existence of syphilitic-bone diseases (Mathias), contend that specific affections of the bones are a combination of syphilis and mercurialization—syphilis that has been modified by a treatment with mercury. But neither Overbeck's experiments nor Kussmaul's clinical observations furnish any evidence that mercurial disease of the bones occurs. Mercury attacks only the maxillary bones with periostitis and necrosis, and then only in consequence of mercurial stomatitis, when the mineral was used injudiciously and in excessively large doses, and was followed by gangrene of the mucous membrane, and the periosteum of the maxillæ. There then originate those large, pumice-stone-like, porous, hypertrophic growths which are known by the name of osteophytes, and differ strikingly from syphilitic affections.

It is impossible to determine at present from an anatomical standpoint whether any given affection of the bone is of *scrofulous*, *syphilitic*, or *gouty* nature; nor will it ever be possible, as Engle says, to characterize any form of osteophyte as pathognomonic of this or that dyscrasia. If the disease of the bones be not of a gummous character, the clinical physician will have to rely upon a number of symptoms to form a diagnosis just as he is compelled to do in specific diseases of the skin and mucous membrane. The diagnosis is rendered all the more difficult by the fact that in many cases most of the symp-

toms of syphilis are absent, because specific affections of the bones very often occur without any syphilitic manifestations on the skin and mucous membranes.

In opposition to this view, Ricord maintains that exostoses originating from syphilis oftener affect the upper surface, while those resulting from scrofula affect the parenchyma of the bone. Rokitansky and Virchow assert that the plano-convex osteophyte deposited upon the cranial bones is a form of disease peculiar to syphilis. We have already alluded to the fact that both of these authors maintain that specific cicatrices of bones are peculiarly constituted. In regard to gout or rheumatism, we believe that this dyscrasia produces the gouty nodes rather upon the small joints—for example, the fingers and toes; and, further, that it deposits its inflammatory product in the form of a powder upon the cartilages of the joints, while syphilis affects the shaft of the bone.

Syphilis of the bones occurs more frequently in women than in men; furthermore, it is a frequent symptom of hereditary syphilis occurring in youth.

Syphilitic Affections of the Joints.

Arthropathies originating from syphilis occur very seldom. The few joint affections in syphilitics that came under our observation generally attacked the knee and ankle, more rarely the acromial joint, and rarest of all the elbow-joint and wrist-joint. We have no positive evidences that syphilis exercises any influence in the production of joint affections. Some of the arthropathies which we noticed on syphilitic patients were recent, appeared in an acute manner, and were attended with violent pains; some consisted of degeneration of the joints, hydrarthrosis, tumor albus, and ankylosis. In most cases antisyphilitic treatment exercised no beneficial influence over the affection of the joint, while general and local treatment directed against the presumable underlying chlorosis, scrofula, or gout, was crowned with better success. But even those affections of the joints which get well under antispecific treatment afford no proof that they were of syphilitic nature. We are only justified in maintaining that a joint is the site of syphilis when it is pathologically demonstrated that the spe-

cific morbid product of syphilis, gumma, is found in the structures entering into the conformation of the joint. Till then the occurrence of specific affections of the joints will remain doubtful, to say the least. Lancereaux mentions two cases of syphilitic affection of the knee-joint in which gumma-like tumors were found in the synovial capsule and in the ligaments of the joint.

Recently many authors—especially Nélaton, Lancereaux, Chassaignac, Archambault, Lücke, and Erlach, in Berne; Bergh, in Copenhagen; Volkmann, in Halle; and Taylor, in New York—have called attention to a disease of the phalangeal joints, originating from syphilis, which has been described as *dactylitis syphilitica.*

Specific dactylitis occurs in the fingers and toes. The affected phalanges are markedly increased in thickness, so that they are unable to retain their position between the fingers, and lie upon their fellows. The swelling, moreover, is not only noticeable on the diseased phalanx, but also on the adjoining phalanges. The skin of these phalanges is bluish in color, the swelling is tense, and on pressure felt to be elastic, but leaves no depression; it is more prominent on the dorsal than on the volar surface of the affected bones. The movements of the diseased joints are more or less interfered with, and on forcible motion crepitation may be felt in the joints; active movement is almost impossible. The pain even on pressure is generally slight. In those cases that came under our observation, the first and second phalangeal joints were most frequently involved; the metacarpo-phalangeal joint not so often.

Syphilitic dactylitis is due to gummous deposits in the subcutaneous connective tissue, periosteum, bone, and the textures entering into the formation of the joint. The diagnosis of the specific origin of this affection can only be firmly established by the previous and present history, and the result of treatment. In most cases an appropriate treatment will bring about complete recovery; sometimes there results a pyoarthrosis, or the disease terminates in atrophy of the diseased phalanx, while the integument, joint, and tendons remain normal.

Syphilitic Affection of the Cartilages.

The cartilages of the nose, eyelids, and larynx, in consequence of syphilis, may undergo the same kind of morbid alterations, attended by suppuration, as are observed on the contiguous skin and mucous membrane. If only a small piece of mucous membrane overlying the perichondrium is destroyed, the affected cartilage will be perforated at that point, as is the case with the cartilage of the septum nasi; or if the cartilage itself is attacked, a piece of it will slough away by carious ulceration, as is often seen to occur on the epiglottis. In either event the rest of the cartilage suffers no textural changes.

The case is altogether different with the thyroid cartilage —here perichondritis and ossification of the cartilage likewise take place without inflammation. The larynx loses its natural elasticity, and pressure on the lateral surfaces of the thyroid cartilages causes pain. Aside from the fact that in perichondritis the mucous membrane of the larynx is markedly swollen, the aryepiglottic ligaments degenerate into fibrous welts, the vocal cords become thickened, and thus lose so much of their mobility that, on account of the ossification of the thyroid cartilage, the laryngeal cavity is no longer surrounded by elastic but by tense walls, thus causing marked interference with phonation. Caries or necrosis of the thyroid cartilage in consequence of syphilis occurs very seldom. But if ulcers form in the broad part of the mucous membrane, corresponding to the cricoid cartilage, the part of the cartilage that has become denuded will become ossified and carious. If the caries then attacks the upper border of the cricoid cartilage itself, the joint connection with the arytenoid cartilage is destroyed, the latter ossifies, and then likewise becomes necrotic. The adhesions on the cricoid and thyroid cartilages then become so feeble that one of the arytenoid cartilages may be coughed up, or an abscess forms in the vicinity through which the cartilage is expelled. If the abscess encroaches upon the cornua of the hyoid bone, the latter will also become necrotic and expelled through the aperture. This kind of degeneration and destruction of the cartilages of the larynx may also originate from laryngeal tuberculosis.

Syphilitic Affections of Muscles, Tendons, and Sheaths of Tendons.

Disease of some of the muscles is a painful and not infrequently a grave affection that occurs in the later stages of syphilis. Specific disease of the muscles is sometimes accompanied by pains like those of muscular rheumatism. The pains gradually increase in severity till they attain such an intensity that the muscles become perfectly rigid and immovable. They are then in a state of constant contraction. The pains in some parts of the muscles will be considerably aggravated by contact. They often subside, but increase in severity when attempts are made to extend the limb forcibly.

The disease of the muscle results from a chronic local inflammation of the muscular sheath, in which a circumscribed hypertrophy caused by proliferation of connective tissue ensues, so that the primitive muscular fibers are destroyed and absorbed. At the places where the muscular structure is destroyed, the connective tissue that proliferates from the perimysium may, under certain circumstances, according to Nélaton, increase to the size of a hazel-nut or hen's egg, and constitute a gumma. Contrary to Nélaton's statement, however, we were seldom able to discover a muscular node by the sense of touch; nor, as a rule, did we find any change in the color of the skin over the affected parts.

The morbid alteration is usually situated in the belly of the muscle, but is said to occur likewise in the tendinous part. According to our observations, syphilitic contractures took place in the vast majority of cases in the biceps brachii, next in the biceps femoris, once only in the left sterno-cleido-mastoid, in consequence of which collum obstipum originated.

There are some cases of strabismus occurring in syphilitic patients which may not be due to peripheral or central affection of the nerves of the ocular muscles, but to gummous alterations in the ocular muscles themselves. Nélaton has seen gummata in the biceps brachii, pectoralis major, masseter, in both gemelli, in the rectus abdominis, and in the semi-membranosus.

We once saw a patient in whom gummous tumors formed

in the peroneus of the right leg and in the tibialis posticus of the left leg. The tumor of the tibialis posticus diminished markedly in size after the internal use and local application of iodides. The gumma in the peroneus degenerated and broke through the skin, spreading downward till it reached the corresponding malleolus.

Syphilitic muscular disease, when recognized early and treated rationally, lasts only a short time; left to itself it will last a much longer time. If the connective tissue which proliferates into the muscular fibrillæ is absorbed, the affected muscles may be completely restored and capable of performing their function; but if the morbid lesion has lasted for a long while, the muscle becomes atrophied and forever remains contractured. Specific muscular tumors may become soft and break through the skin above them. It is claimed that restitution of the muscle is possible even after the skin has been ruptured, if the morbid changes of the muscle do not extend too deeply. In the latter event, the muscle invariably atrophies.

There is no doubt whatever that the *sheaths* of the *tendons*, like any other organ or part of an organ, may become affected by syphilis.

Diseases of the tendinous sheaths are, however, very rare, few instances being recorded in medical literature. In the year 1868 Verneuil reported the occurrence of serous effusion into the tendinous sheaths of the extensors of the fingers in syphilitic patients. In Verneuil's four cases, all of which were observed in women, the affection of the tendinous sheaths occurred simultaneously with the outbreak of secondary manifestations. There was considerable exudation, but it never extended to the forearm; it fluctuated distinctly, and the swelling was sharply defined; the skin was not changed. Fournier, commenting on the report of Verneuil's cases, says that he has seen six cases of this kind, and thinks the disease is of frequent occurrence. This author met with syphilitic affections of the sinews and tendinous sheaths on the extensor muscles of the toes, on the tendo-Achilles, on the biceps of the upper and lower extremity, on the supinator longus, peroneus, etc. According to Fournier, "painless tumors with marked exudation

occur; but sometimes inflammatory phenomena, attended by redness of the skin, are present. In other cases, little or no fluctuation is felt, the tumor is doughy, or the affection can only be recognized from the impaired function of the muscle and painfulness of a tendon on pressure. Gummata have also been observed on the sheaths of tendons. Thus, Bäumler mentions a case reported by Nunn, in which a pale, yellowish tumor, half the size of an orange, formed in the tendons on the dorsum of the foot, in a person forty-five years of age, who for twenty years had suffered from syphilis. It was expelled by suppuration through the skin—a similar one having been expelled in the same manner, some time previously, from the sinews on the side of the knee." Chouet, in his valuable work, also describes a case of a gumma which developed in the tendinous sheath of the anterior peroneus muscle of the right side. The gumma underwent degeneration and sloughing. This lesion appeared fifteen or sixteen years after the person became infected. We saw in a person affected with syphilis bilateral hygroma of the forearms, corresponding to the common extensors.

Syphilitic Affection of the Bursæ.

We have never had an opportunity of seeing an undoubted case of syphilitic affection of the bursæ; hence, we can only refer to the writings of other specialists upon this specific affection. Keyes, for the sake of analogy, divides syphilitic affections of the bursæ into the secondary and tertiary forms. He has never seen a case of secondary bursitis with or without exudation into the bursa; still, he thinks the existence of this lesion, comparing it to other similar affections of the joints and of the tendons, is very probable. Allusions to the occurrence of secondary syphilitic bursitis without effusion are found in the writings of Jules Voisin, Fournier, and Adolphe Vaffier. Gosselin, Fournier, and Verneuil have described graphically inflammation of the bursa with effusion. *Secondary* syphilitic inflammation of the bursa causes little inconvenience, and may therefore easily be overlooked. *Tertiary* affections of the bursa, on the contrary, are not so unusual. According to Keyes, it is not possible to divide them into the gummous and

hyperplastic forms, as there is no proof of the occurrence of the latter. All the known cases are of the first form. There are no post-mortem observations of this disease. From a clinical point of view, however, two kinds of gummous bursitis may be distinguished: One occurs by the extension of the disease from adjacent tissues; the other originates in the bursa itself. Keyes relates fourteen cases—seven of which are not yet reported—of tertiary, specific bursitis. In twelve the bursæ were primarily affected. The bursæ in the vicinity of the knee were affected eight times; those over the patella on both sides, in three cases; on one side, in two cases; over the tuberosity of the tibiæ, in one case; between the insertion of the semitendinosus and the lateral ligament of the knee-joint, each one—upon both sides alike, and upon one side alone. In the other four cases, the bursa was affected on one side only over a malleolus, under a corn, in the palm of the hand, and over the olecranon process. Both sexes are equally affected by it; but, in all of the six women, the bursæ of the knee only were diseased. The average age of the patients was thirty-five years. The shortest time that elapsed between the occurrence of the chancre and that of the bursitis was one and a half year; the longest, eight and a half years. In half of the cases, an injury was found to be the causal factor that started the lesion. In all cases the disease ran a painless course till the skin became involved. Fluctuation could only be detected in some cases, and then indistinctly. Antisyphilitic treatment generally brought about a rapid recovery—in all, marked improvement. For further information, we refer the reader to the works of Chouet and Viday.

Endemic Syphilis; Leproid or Syphiloid Disease.

During the last century, and until quite recently, attention was attracted to a peculiar form of disease that appeared like a pest in various parts of Europe and America. Sometimes this was regarded as a modification of leprosy (lepra seu elephantiasis græcorum), and then again as a degenerated syphilis; and, according to the relative view of the matter, was described either as leproid or syphiloid. These forms of disease were popularly designated according to the place or province where they

occurred most frequently. Thus, in Norway and Sweden it was called "*Radesyge*" (from *rada*, bad, miserable, and *syge*, pest); in other places—the Holstein, the *Ditmarsian*, or *marsh*—the *Jutland* disease; in the Austro-Hungarian Empire, *Skerlvejo* or *Scherlievo*, after a village in Fiumaner County. There are still other synonyma: *mal di Fiume*, *di Fucine*, *mal di Ragussa*, *di Breno*, *Falcadine*. It was also spoken of as Lithuanian or Courlandian and Hessian syphiloid. In Servia the disease belonging to this group was called *Frenga;* in the Bukowina, in Liebenbürgen, in Roumania, *Boala;* in Greece, "*Spirokolon*, *orchida*, and *Frango*." In French Canada it was known by the name of *mal de la Bay de St. Paul*, *mal Anglais*, *maladie des éboulements*, the *Ottawa* disease, and as *Canadian* syphiloid. In Scotland syphilis occurring endemically was described as *siavvin*, *sibben*, or *sibbens*, owing to the resemblance of the moist cutaneous nodes, which the evil engendered, to a cluster of Scottish strawberries, which in the Celtic dialect is called *sivvin*. On closer investigation these endemic diseases proved, in the vast majority of cases, to be hereditary and acquired syphilis; but especially the inveterate and neglected variety, the so-called tertiary manifestations. In addition, many other ordinary chronic diseases of the skin, such as chronic eczema, lupus, psoriasis, etc., were included. These endemics of syphilis were soon subjugated by the sanitary regulations that were established for the control of the patients, and by hospitals, where the disease was treated by antisyphilitic remedies.

[Malignant or Galloping Syphilis.

By the term *malignant or galloping syphilis* (already alluded to on page 172) is meant a form of syphilitic disease that runs an exceedingly rapid course, but which differs very little from ordinary syphilis in the essential features of the fundamental malady. The lesions of the different manifestations present only the characteristic trait of running an extremely rapid course. Ordinarily, the morbid phenomena, after the acute stage of the eruption has passed, lapse into a markedly chronic condition, but in the galloping form the disease retains its acute character, and the eruptions that fol-

low succeed one another very rapidly, so that the lesions commonly denominated tertiary appear within a few months from the time the patient became infected. The secondary period, which ordinarily lasts two and three years, is here only of short duration; indeed, in some cases no secondary phenomena are noticeable at all, the very first eruption being tertiary in character, the disease sometimes overleaping the secondary and lapsing into the tertiary stage in perhaps three months from the time infection took place.

None of the constitutional phenomena of malignant syphilis, including the primary initial lesion, display any marked deviation from the corresponding manifestations of cases that run an ordinary course. Neither the site nor the formation of the initial indurated lesion, neither a gangrenous, nor any other peculiarity of the chancre, has any effect in producing this form of syphilis. Even the first eruption usually presents nothing peculiar, though the one following may assume a tertiary character. In some cases, again, the first general manifestation of the disease may be a pustular eruption and the efflorescences, instead of desquamating and healing, are rapidly converted into ulcers. In that case the ulcerating tertiary syphilides differ from their prototype of ordinary syphilis by appearing in greater numbers, the entire body being covered by them. They vary greatly in form, and are more confused and irregular in the cases that run a rapid course. Gummata of the skin are seldom or never seen early in malignant syphilis, a circumstance that is easily explained by the rapid course of the disease, and by the great tendency of the morbid product to undergo suppuration. Specific affections of other organs, of the mucous membranes, bones, viscera, etc., present as little diversity in malignant syphilis as the morbid products of those organs in cases that run an ordinary course, differing only as regards the time of their appearance. There is but one symptom that is pathognomonic of this variety of syphilis, namely, the occurrence of febrile phenomena previous to the outbreak of each successive eruption, while in ordinary cases the several eruptions are not generally ushered in by fever.

The most important feature in the course of galloping

syphilis, as already intimated, is the early appearance of what has been denominated tertiary phenomena, and the total absence or brief duration of the secondary stage. But as the lesions of syphilis have been arbitrarily classified, and no symptom or group of symptoms is indicative of the stage of the disease, it is impossible to draw a line between the cases that run a normal and those that run a rapid malignant course, according to the period that has elapsed from the time infection occurred till the appearance of the first eruption. Still, it will not be amiss to consider those cases in which tertiary manifestations appear in the course of the first year as belonging to the galloping or malignant variety. It will also be self-evident that, when the disease runs such a rapid course, the various manifestations will be complicated by preceding and subsequent morbid phenomena. Hence we have in galloping syphilis new outbreaks of eruptions before the preceding ones have been cured, and these eruptions or the lesions of the viscera always manifest the late character of the disease.

Notwithstanding the rapidity of the course and the severity of the various manifestations that characterize malignant syphilis, instances have been known in which the subsequent outbursts of morbid phenomena occurred at longer intervals, the eruptions were less severe and fewer in numbers, the succeeding efflorescences being papular and segregated instead of ulcerating and aggregating; and, finally, even this galloping malignant syphilis seems to have run its course, and the disease, like an extinct volcano, has apparently died out.

In regard to the diagnosis there is nothing in the phenomena of galloping syphilis that is likely to render it more difficult than in ordinary cases. Indeed, the multiplicity and profuseness of the eruptions, and the severity of the ulcerations are apt to render it all the more easy. But in regard to the prognosis the case is altogether different. It is evident that the terrible and frequent eruptions, the intensity of the ulcerations, the recurrence of the febrile phenomena, must ultimately exhaust the patient and terminate in death. Another circumstance that adds to the gravity of the prognosis in malignant syphilis is the danger to the internal organs, especially the brain, which may be attacked early in the disease; some-

times, indeed, before the expiration of the first year. Such cases usually terminate fatally (Fournier).

In regard to the causes that will produce galloping syphilis in a certain class of patients, little definite is known. There is good authority for saying that the malignant or galloping form was quite common when syphilis first appeared epidemically; it is now, however, quite rare. Unquestionably it depends upon certain conditions of the constitution of the patient for its production—cachexia, alcoholism, depraved habits, or the like—and which render the system less able to resist the virulency of the syphilitic poison on the one hand and less amenable to treatment on the other. Still, I can recall two instances where none of these conditions obtained, both patients being entirely free from any discoverable taint that could have served as a cause for the production of this form, since they were middle-aged, well-developed men with good previous histories.

The results of the treatment of this particular form of syphilis may be readily inferred from its character. It is exceedingly obstinate to treatment, and successful results are obtained in exceptional cases only. The exhaustion consequent upon the extensive drain upon the system from the numerous and severe ulcers, the debilitating intercurrent febrile attacks, or the speedy encroachment of the disease upon some of the important viscera, will nullify the physician's efforts and hasten the fatal end.]

Hereditary Syphilis.

By the term *hereditary syphilis* is meant that species of syphilis that is inherited from syphilitic parents by the progeny begotten by them. Hereditary syphilis is mainly characterized by the fact that the individuals affected by it never present any primary specific lesion. In the majority of cases hereditary syphilitic children are born with the evidences of the disease, or the manifestations develop during the first few weeks of extra-uterine life. Generally, the signs of hereditary syphilis appear during the first three months after birth. In very rare cases the symptoms do not come on till the time of puberty of the unhappy victim, this form being designated by

the term *syphilis hereditaria tarda.* Hereditary syphilis may, therefore, be subdivided into two varieties, viz. (1) *syphilis hereditaria præcox* (which appears a short time after birth), and (2) *syphilis hereditaria tarda* (which does not appear till a long time after birth, usually at the period of puberty).

In regard to the theory of inheritance, we may, relying upon our experience and that of other authors, lay down the following aphorisms:

1. If one of the parents is syphilitic at the time the child is procreated, it may be syphilitic.

2. There are cases in which syphilitic parents, even while still manifesting evidences of recent syphilis, procreate healthy children.

3. When a mother, healthy at the time of procreation, gives birth to a child who has inherited the disease from the father, the mother will suffer from latent syphilis at the most, because till now only three cases are known of mothers becoming infected by the hereditarily syphilitic children whom they suckled. (The infection of the mother by a syphilitic child, through the placental circulation, according to Ricord and Diday, is called *choc en retour.*) The circumstance that mothers never, or very seldom, are infected by their own children during wet-nursing, is now known as Colles's law.

4. If both parents were sound at the time of procreation, and the mother acquires syphilis during pregnancy, the child may, after being begotten, become syphilitic. The later in the period of gestation the infection of the mother occurs, the more probable is it that the child will remain well, because the contagium of syphilis has a shorter period in which to exercise its effect upon the child. This kind of infection of the children is called *infectio in utero* (Kassowitz), or, according to Vajada, *post-conceptional humoral infection.* The placenta is no obstacle to the passage of the contagium from the mother to the fœtus, or the reverse.

5. The more recent the syphilis in the parents, the more probable is it that the child will be infected, and the graver the manifestations in the latter are apt to be. Generally, the infants are still-born, or come into the world bearing specific manifestations.

6. If the disease in the parents is latent, the child will develop syphilis a long time after its birth. Grave forms of the disease are then rare, still they are not always absent in children of such parents.

7. The longer the time which has elapsed after the specific symptoms in the parents have disappeared, the less probable is it that they will beget syphilitic children.

8. In the majority of cases, syphilis in the parents gradually grows feebler, so that, after begetting some syphilitic children, they finally procreate healthy ones.

These aphorisms are the conclusions of our experience. No infallible dogma for hereditary syphilis and its dissemination, however, can be laid down, and we and others have certainly met with exceptional cases, which will afford food for thought concerning the dissemination of the disease. No doubt that, by closer observation and more accurate knowledge gained concerning heredity in general, the mystery that still envelops much that is strange and hidden in the study of this chapter of syphilis will be solved, and the progress of science in the future will find the key to these problems.

In regard to the influence that syphilis *exercises upon pregnancy*, it may be premised that the fœtus very often dies *in utero* very early, and then the macerated fœtus (*infantes semicocti*), presenting the appearance of having been scalded, is aborted. Whether the death of the fœtus is the result of disease of the fœtus itself, or of the uterus and placenta, has not yet been definitely decided. Pollnow regards *hydrops sanguinolentus* as an intra-uterine disease of the fœtus, and hereditary syphilis as one of the most frequent causes of it. Barnes thinks that syphilis engenders a morbid condition of the uterine mucous membrane—a chronic inflammation—and since the placenta which develops from the latter is the organ through which the fœtus derives its nutriment, the latter must naturally die when its fountain of nutriment is diseased. Virchow found morbid alterations in the maternal part of the placenta that reminded him strongly of gummous tumors (*endometritis placentaris gummosa*). Frankel has also demonstrated, in the fetal part of the placenta, a degeneration produced by cellular proliferation of the placental follicles, which

may cause compression and obliteration of the follicular vessels, and finally terminate in fatty degeneration and atrophy of the placental follicles. Oedmanson found, in five cases of abortions produced by syphilis, alterations in the *umbilical vessels* and in the placenta. The umbilical vessels presented atheromatous inflammation of their walls; in the main branches thrombi were found constituting the picture of interstitial placentitis. H. Zeissl noticed that the placentæ of syphilitic women are comparatively smaller, feebler, and wilted, fatty, pale, and friable; the surface facing the uterus presents small or large spots of so-called hepatization, which, in the upper strata, are infiltrated with calcareous incrustations.

Children, who are overcome by the syphilitic diathesis during intra-uterine life, are either born with the manifestations of the syphilis, or the latter appear in the first few days after birth. However even children begotten by fathers suffering from latent syphilis may come into the world apparently well, and remain well during early infancy. Later we notice the gradual formation of infiltrations (falsely called *lupus syphilis hereditaria*) upon some parts of the skin, with simultaneous destruction of the soft palate and the nasal bones (*ozæna syphilitica*), the occurrence of hyperplasiæ on the cranial or tubular bones, etc.; phenomena which formerly, even more than now, were deemed evidences of scrofula. Hence, as has been remarked, a *congenital* syphilis may be said to occur which manifests itself *in utero*, or a few days after birth, and an *inherited* syphilis, which casts off its mask later during youth. If syphilitic phenomena appear in a nursling several months after birth, such as we see in the first phases of acquired syphilis, they should not be regarded as the results of inherited syphilis, but of syphilis acquired *per partum* or *post partum*.

In regard to mothers who give birth to children with hereditary syphilis, we wish to add, that Hutchinson believes that repeated bearing of syphilitic fœtuses gradually engenders a specific poisoning of the mother, and that the consequences of this poisoning often appear very late, in which case they manifest themselves at once as tertiary phenomena. Bärensprung maintains that the semen of a syphilitic man, which,

under ordinary circumstances, is innocuous for the woman, will infect her as soon as he impregnates her. Women who, at the time of conception, are affected with recent syphilis, seldom give birth to a viable fœtus; they generally abort or miscarry at the beginning of the eighth month or earlier. According to Whitehead, four per cent of syphilitic infected mothers abort. We can not confirm the views of Mayer and Bednar, that all mothers affected with constitutional syphilis are absolutely sterile; still, H. Zeissl met with many cases of women suffering from internal syphilis who were unfruitful. He saw women who had no signs of syphilitic primary lesion, or any specific exanthema, affected with periostitis and falling out of the hair, and with intense anæmia, which phenomena disappeared upon antisyphilitic treatment. He believes that in these cases the semen of the syphilitic man was the medium of infection of the woman.

Manifestations of Congenital Syphilis.

Congenital syphilis engenders morbid alterations similar to those produced by the acquired form. Infants affected with marked hereditary syphilis at the time of birth are, as a rule, badly nourished; the skin generally, and that of the face especially, is wrinkled, giving them the appearance of a weazened, marasmatic old man.

The morbid alterations of the general skin resemble very much the analogous eruptions of acquired syphilis in the adult. According to our experience, however, congenital syphilis of the skin appears only under three main forms, namely, macular, papular, and bullous syphilide. We never saw rupia, ecthyma and cutaneous nodes in infants.

As a sign of hereditary syphilis manifesting itself in the earliest period of infancy, Hutchinson mentions the peculiar curving of the upper incisor teeth; this lesion is said to be due to a faulty development of the dental sacs that keeps pace with the general atrophy of the body. As a consequence, the permanent incisors remain short and narrow, being wide at the base, and their angles rounded; their lower borders are deeply indented in the center; they have a dirty-yellowish color, and seem to be semi-transparent. Similar signs, if they appear on

the other teeth, are said to be of no diagnostic value. We are not inclined to attach much importance to them.

Macular Syphilide in the Infant; Erythema Maculo-papulatum Syphiliticum Neonatorum.

This syphilide generally develops in the first weeks of infancy, if the new-born child does not come into the world with it. A late appearance of macular syphilide in the infant always indicates that it was not infected *in utero*, but outside of it, *post partum* or *per partum*. Macular syphilide of the new-born presents the same characteristics as its prototype in the adult, originating through acquired syphilis. Most of the spots that attract attention are situated on the sides of the thorax, becoming sparser toward the sternum; they are never seen on the neck and face; a few occur on the forehead where the hairs cease to grow.

If the affected child is not treated promptly and judiciously, other syphilitic phenomena quickly make their appearance on different parts of the body. Flat, copper-colored nodules, as big as a lentil, then form on the palms of the hands and soles of the feet, and on the heels, and soon become covered with yellowish scales, which may be easily pulled off, or excoriations and fissures (rhagades) originate on the places mentioned, especially on the heels. Frequently the grooves near the alæ nasi are remarkably red, and covered with fine, whitish scales, while mucous-membrane papules are present at the angles of the mouth and nasal orifices, upon which the mucus has dried and formed crusts. These kinds of humid cutaneous or mucous-membrane papules form in the folds of the buttocks, in the hollow of the knee, at the anus, scrotum, and in the genito-crural folds of both sexes. The papules that are met with on the latter places soon lose their caruncular condition, from causes already mentioned, and are then likely to be mistaken for intertrigo. The denuded corium on these places secretes a yellowish, glutinous fluid that speedily putrefies. In many infants, erythema maculo-papulatum syphilitica appears, as in the adult, on the internal surface of the prepuce, on the glans penis, and on the labia minora. Or circumscribed dark spots, varying in size from that of a lentil to that of a bean, occur on

those places, which become excoriated by catarrh of the glans or of the vulva (that is frequently present), and are transformed into bright red abrasions.

In some cases, a few solitary lenticular papules are found among the roseola-spots, mostly on the elbow and on the internal surfaces of both thighs. We never saw macular syphilide on the new-born or nursling without the simultaneous presence of moist papules on some places, for instance on the anus, labia majora, angles of the mouth, and between the toes. The cervical, axillary, and other glands seldom swell up to such an extent in consequence of syphilis congenita in the infant as in the adult.

So long as no phenomena of suppuration supervene, macular syphilide in the new-born child runs an apyrexial course. We can recall but one case of recovery of a child affected with syphilis congenita maculosa. All the others became anæmic, and terminated their miserable existence in about two or three weeks, from complications with exhausting diarrhœa, bronchial catarrh, or pneumonia.

Papular Syphilide in the Infant.

We found that papular syphilide, in its various metamorphoses, occurs less frequently than the macular form in the new-born, and, in regard to location, succession to and combination with other syphilides, it behaves precisely as does its prototype in the adult. We have rarely seen the so-called papulo-miliaries or lichen miliaries syphilitica as the result of congenital syphilis. In children who do not bring papules into the world with them, the eruption will not develop simultaneously on all the places where they usually occur; this accounts for the finding on such infants of young and old papules.

In rare cases, the papules are grouped together so closely, on some places, that their scales form an almost unbroken coat-of-mail. Most of the scales, in the two cases that came under our observation, occurred on the back, sides of the chest, on the palms of the hands and soles of the feet, and, in part, on the forehead and nape of the neck.

Pustular, Gummous, and Hæmorrhagic Syphilide in the Infant.

We observed pustular or bullous cutaneous affection in the new-born more frequently than papular syphilide. Infants either bring it with them into the world, or they become affected by it during the first week after birth. In the latter case, brownish-red spots or papules, varying in size from that of a lentil to that of a pea, slightly elevated above the level of the skin, are found on the forehead, especially near the eyelashes, in the face, now and then on the chin, on the buttocks, on the extensor and flexor surfaces of the extremities, and, in greatest numbers, on the palms of the hands and soles of the feet. Within three or four days, most of these spots and flat papules are changed into flabby pustules, containing yellowish-green, thin pus, of the size of a pea and larger. The pustules are not perfectly round; here and there, especially on the palms of the hands and soles of the feet, they are indented and irregular, as the result of the coalescence of several aggregated efflorescences. The center of the pustules collapses speedily, whereby the umbilicated depression ensues. But, while the central depression of the cover of the pustule dries, and forms a thin crust, the remaining purulent contents raise the contiguous epidermis, and the pustular wall that has not yet dried is thereby increased in circumference. The reddened cutis beneath the thin crust is found somewhat injured, as in varicella and impetigo of the nursling and adult, but by no means very seriously. This is a somewhat hastily sketched morbid picture of the cutaneous disease which is generally described as pemphigus syphiliticus neonatorum, a synonym, which H. Zeissl deems incorrect, since neither *transparent* vesicles form, nor, as in pemphigus foliaceus, do the contents of these blebs, that speedily become opaque, wash away the epidermal covering, resulting sometimes in the exposure of a large extent of inflamed cutis. H. Zeissl therefore deems it more correct, in accordance with the laws of analogy, to describe the eruption under consideration as *varicella syphilitica confluens neonatorum*, because in the latter, as in the confluent varioloid syphilide of the adult, an umbilicated depression of some of the pustules containing thin pus, recurs.

Severe excoriations generally occur on the heels as an accessory phenomenon in the bullous or pustular syphilides of the new-born. The nasal cavities of most of these infants gradually become occluded by the drying of the secretion of the Schneiderian membrane, in consequence of which breathing through the nose becomes difficult, if not impossible—the little patient being obliged to gasp for breath, and unable to suck the breast. If the precarious existence of a new-born child affected with pustular syphilide is prolonged for a fortnight or more, paronychial swellings will form on some of the ungual joints of the fingers and toes; most of these swellings begin to suppurate near the matrix of the nail, whereby the latter is subsequently cast off. We have never seen onychia sicca in children afflicted with hereditary syphilis. The same is true of the falling out of the hair and eyebrows as a result of syphilis congenita.

Pustular syphilide is attended by a rapid pulse, and for that reason the patients are very restless. All infants affected with this syphilide that came under the care of H. Zeissl (most of them foundlings) died before they attained the age of two or three weeks; those that were born with the eruption seemed even more wretched, and succumbed in a week. Those that are attacked by the bullous form frequently die *in utero.*

It is very difficult to distinguish between the pustular syphilide and *pemphigus cachecticorum* of the new-born. The only sign by which, according to our observation, these two cutaneous diseases can be distinguished from each other is, that in pemphigus cachecticorum the bullæ dry, form crusts, and exfoliate much more quickly than in pemphigus syphiliticus. After pemphigus cachecticorum has formed crusts and exfoliated, the former efflorescence quickly becomes covered with a new epidermal layer, while the pustules in the so-called pemphigus syphiliticus are more persistent, and after they have exfoliated new skin very seldom forms upon them; nor do any new pustules originate in the former on the places where some had already been located. While all the new-born children afflicted with syphilitic pemphigus that came under our observation died, those suffering from the cachectic form sometimes recovered under good nursing and care.

In infants we very rarely saw impetiginous or the so-called crustaceous syphilide in the form of small, impetiginous crusts on the scalp. We have not met with acne syphilide, ecthyma, or rupia in the new-born as a result of syphilis; on the other hand, in the few cases of rupia in grown-up children that came under our observation, we could always detect the spot where the infection took place, and thus prove that the child acquired syphilis after it was born. From personal experience we feel equally justified in denying the statement that vesicular syphilides, such as herpes and eczema syphilitica, ever occur in infants.

We have repeatedly seen *nodular syphilide*, or suppurating or perforating tubercles, as a symptom of hereditary syphilis, but only in children several years of age, in the form of nodes that became transformed into confluent serpiginous ulcers. This lesion never occurs in the form of scattered nodes in the new-born or nurslings.

So far we have met with no cases of *syphilis hæmorrhagica*, such as have been reported by Bältz, Behrend, Deahna, and others. Hæmorrhagic syphilis, according to Behrend, is a peculiar morbid alteration in the circulatory apparatus which occurs almost exclusively in inherited venereal disease; Bältz is the only one so far who has described a few cases that have been observed in the adult. It is characterized by ecthymous eruptions on the skin, in the subserous tissues and the meninges of the brain; and probably also in the parenchyma of the organs; furthermore, by hæmorrhage from the navel, after the cord has fallen off, so that we may have purpura and omphalorrhagica syphilitica, in combination or separately. Either may occur with profuse bleeding from an accidental injury, or from the apparently sound mucous membrane of the mouth, nose, or intestinal canal.

Behrend regards the marked fragility of the blood-vessels and diminished coagulability of the blood as causes of the bleeding which is produced by syphilis. Hæmorrhagic syphilis is not identical with hæmophilia, for the latter represents a permanent diathesis that will last through life; the former, a transient hæmorrhagic diathesis.

Syphilitic Affections of the Mucous Membrane in the Infant.

In congenital syphilis, as in acquired syphilis of the adult, the mucous membranes are affected mostly in those parts that are visible. Accordingly, the nasal mucous membrane, especially at the margin of the nares, the mucous membrane of the mouth from the red border of the lips to the fauces and larynx; furthermore, the mucous membrane of the anus and genital organs—where it merges into the common integument—will be affected. Of all the places the lips, especially the angles of the mouth, are the most frequent sites of specific affections; next to this the isthmus faucium, the tongue, the internal surface of the cheeks, and the lips; furthermore, the mucous membrane covering the cartilaginous part of the nasal septum. We have never seen any syphilitic diseases on the posterior wall of the fauces, pharynx, and the higher regions of the nasal passages in infants and older children. Very frequently, on the contrary, the mucous membrane covering the vocal cords and Morgagni's cavity of the larynx is swollen and diseased—a condition which, owing to the inaccessibility of the parts, is only detected by the crying of the infants, who then emit peculiar piping-shrill tones.

The morbid alterations of all the parts just mentioned manifest themselves by permanent redness, erythema, or by the formation of scattered or confluent papular inflammatory foci. The epithelial cells on the papular inflamed spots are either pearly-white, the opacities disappearing if the papules are absorbed, or if they degenerate and suppurate the epithelial cells are destroyed, whereby the affected places are transformed into erosions that bleed readily or into superficial ulcers. Suppuration ensues on the places that are most exposed to pressure or friction—thus, on the lips, at the angles of the mouth, and at the margin of the anus. At these places the denuded swollen cutis generally cracks, and then quite deep fissures and rhagades form. These bleeding crevices become covered with crusts composed of blood and matter, and render sucking and defecation painful. This process recurs on the tonsils, uvula, and palatine arch.

In the nursling we have seen vegetations (pointed condyloma) occur only on the mucous-membrane papules at the anus.

We have only seen gummata, and deep ulcers resulting from them, in the mucous membrane of the mouth, fauces, and nasal cavity—never in that of the rectum or external genital organs. Once we observed deep ulcers in the tonsils in coexisting gumma of the tongue.

Syphilitic affection of the nasal mucous membrane—*coryza syphilitica neonatorum*—originates in the following manner: The nasal mucous membrane, especially that of the cartilage of the nasal septum, becomes markedly red and slightly swollen. Occasionally the epithelium even here is opaque or abraded, and at first secretes a profuse but thin mucus, which gradually becomes thicker, yellowish, purulent, and finally ichorous. The mucous membrane of the nasal tracts is eroded by the irritating discharge and bleeds easily, the discharge becoming streaked with blood. Like the mucous membrane of the septum, the margin of the nasal orifices and the skin of the upper lip become excoriated. The thicker the discharge, the larger the amount of blood that exudes, and the greater the number of blood-coagula, the more will the already swollen nasal passages become narrowed, so that the little patient is almost totally unable to breathe with the mouth shut. Sucking the breast then becomes an unspeakable torture, as the occasionally coexisting affection of the tonsils itself renders that process exceedingly difficult and laborious. We have met but one case of the sinking in of the bony nasal framework by preceding necrosis of the vomer or ethmoid. No case of stink-nose (*punaise*) in the new-born came under our observation. Some years ago J. Neumann published the report of an autopsy on an infant that died from congenital syphilis, and in whom the ethmoid was destroyed, and the bony framework of the nose had collapsed.

All or some of the morbid alterations of the mucous membranes, just described, very seldom occur alone; in most of the cases, they accompany the morbid lesions of the common integument, already described above.

Syphilitic Affections of the Bones and their Tunics.

The skeleton of children suffering from hereditary syphilis may not only be attacked by those diseases of the bones with

which we became acquainted in studying the lesions occurring in persons with acquired syphilis, but in addition it is subject to most remarkable and characteristic morbid alterations. The latter consist essentially in a disturbance of the normal growth of the bones of the infantile skeleton, and represent sometimes atrophic conditions of the pre-formed cartilaginous and osseous substance, and again of new growths of the bony structure. The most frequent, and probably the earliest, bone-affection which is caused by hereditary syphilis is *disease of the epiphysis* of the tubular bones, such as the cartilage-bone junction of the ribs. Wagner, Waldyer, and Köbner maintain that this process is especially pathognomonic of the intra-uterine origin of syphilis. Köbner regards it even as a new pathological differential sign between the latter and acquired syphilis of young children. These authors invariably found in all the congenitally syphilitic children dissected by them, even in abortions of the seventh month, the *alterations of the ossification boundaries* of the *tubular bones and ribs.* Even when the alterations seemed to be macroscopically absent, which was seldom the case, they could be positively diagnosed microscopically. In most cases gummata were found simultaneously in the internal organs, and mucous-membrane or cutaneous syphilide, and syphilitic lesions in the placenta were also present; but, even when all these were absent, the bone-cartilage boundary was sufficiently marked. These observers saw macroscopically all the stages of those alterations from the simple spreading of the cartilage proliferation-zone and the spongy layer of Guérin; from the irregular, shaggy encroachment of the ossification-zone and of the cartilage up to the *total detachment of the epiphysis*, by a widened yellowish zone between the calcareous cartilage and the grayish-red, pulpy substance developed from the spongy portion of the bone. The microscope shows, on the cartilage-bone boundaries, that the young *medullary spaces are choked up with granulation-tissue*, consisting of small, round, or angular and spindle-shaped elements, mixed up and attached to one another by prolongations. In addition, we find sometimes a thick, sometimes, again, in case the *epiphysis becomes detached*, a semi-fluid substance like a sub-periosteal gummata; it never becomes purulent, as Wagner claims, nor is it devoid of

vascularity. The second characteristic which they discovered is the extremely imperfect *development of the osteoblasts*, described by Gegenbauer and Waldyer—large, multiple-shaped cells ready to become ossified, which in the normal bone are found in a continuous layer like epithelial cells, but occur here singly and very imperfectly developed. In their place small granulation-cells, or *long, spindle-shaped* elements, are present. In addition to these *constant* alterations periostitis ossificans was found in the vicinity of the epiphysial boundary, though only in the most advanced cases. Waldyer and Köbner describe this lesion as *syphilitic granulation-growth.*

The inflammatory disease of the "growing cartilage," according to Parrot, produces those *peculiar pseudo-paralyses*, which sometimes occur in the extremities of children afflicted with syphilis congenita. The *causes of motor disturbances* are the suppurating processes resulting from an abscess situated above or below the joint, and which separates the epiphysis from the diaphysis, though the nerves and muscles remain totally uninjured. In addition to the epiphysial detachment mentioned by Lewin, C. Pellizzari and Tafani speak of fractures and infractions in the diaphysis of the ribs, and Parrot describes erosions and perforation of the skull (*craniotabes* and *plagio-cephalia*).

New growths of bony substance and osteophytes occur especially on the lower epiphysial ends of the long bones, and on the cranium in the vicinity of the anterior fontanelle (Parrot's natiform skull).

It is easy to comprehend how the disturbances of nutrition in the growing bones, caused by hereditary syphilis, may be one of the causes of rachitis.

Affections of the Eye in Consequence of Hereditary Syphilis.

Ophthalmo-blennorrhœa very often occurs in children who suffer from congenital syphilis; it sometimes originates when the catarrhal process of a syphilitic coryza is transmitted through the lachrymal ducts to the conjunctiva of one or both eyes.

Whether that lesion in which the remnants of an irido-choroiditis that has run its course *in utero*—namely, the union of the iris and cornea, the latter being covered more or less

with organized material, and intercalar staphyloma—are found, should be described as the effects of hereditary syphilis, is a mooted question even among oculists. Equally uncertain is the question regarding the connection of keratitis parenchymatosa in infancy and youth with hereditary syphilis. Oculists speak more positively regarding the occurrence of *iritis ex syphilide hereditaria.* The diagnosis is based upon the marasmatic condition of the infants, upon the protracted character of the disease, its tendency to form synechia and occlusion of the pupil, and upon the extraordinarily rare occurrence of ordinary iritis in childhood.

Morbid Alterations of the Internal Organs resulting from Hereditary Syphilis.

The most constant and frequent alterations resulting from hereditary syphilis are found in the *liver.* Schott describes the liver in syphilitic new-born children as follows: "It is usually enlarged, dense, reddish, or yellowish—hence, on incising it, it is seen to be speckled in some places; the outlines of the acini are obliterated in most cases, but the incised tissue was found uniform; the more dense and doughy incisions were glossy and lardaceous. In another case there was found, in the hepatic parenchyma, over the large vessels, a roundish, yellowish, white, dense node as big as a pea, around which whitish welts ramified in different directions."

In regard to the forms of syphilitic affections of the liver in the infant, Schott says further: "While the forms of hepatic syphilis in adults vary, perihepatitis, accompanied by lobulation of the liver, or interstitial hepatitis, or, lastly, gummous nodes being present, in children with hereditary syphilis, we find hardly anything beyond induration, seldom any nodes; still, even when nodes are present, we can not always safely conclude that the case is one of syphilis, since other processes, such as effusion of blood in the liver, may also occasion them."

We, too, have seen repeatedly in the liver of syphilitic children, sharply outlined, yellowish-white nodes as big as a hazelnut, proliferation of connective tissue, and cicatricial retractions.

Many physicians look upon an *enlarged spleen* as an important clinical symptom denoting hereditary syphilis. Klebs

found, in the *pancreas* of a fœtus six months old, a number of gumma-nodes, and syphilitic lesions in the lungs, liver, and kidneys. Further, he mentions a case of syphilis in the infant described by Cruveilhier, in which the pancreas was transformed into a white, dense, lardaceous mass; at the same time gumma-nodes were present in the thymus gland and white syphilitic pneumonia was noticed. In twenty-three cases of disease of the epiphysial margin of the bones and enlargement of the spleen, Birch-Hirschfeld found the pancreas affected thirteen times. The morbid lesion consisted of proliferation of the interstitial tissue and atrophy of the glandular parenchyma.

Olivier, Cruveilhier, Förster, and Wagner saw, in the lungs of infants who died from syphilis, lobular indurations which, when cut into, were found to be yellowish, red, or gray in color, the center being cheesy; these indurated deposits were pronounced by them gummata or syphilomata. We, too, have seen similar indurated spots of the size of a hazel-nut in the parenchyma of the lungs in the cadavers of syphilitic infants. Diffused syphilomatous infiltration may extend over both lungs, or affect half of one lung, or even less. The infiltrated places are destitute of air, reddish-gray or yellowish-gray, smooth, homogeneous, and secreting a meager amount of opaque fluid, the bronchial tubes are normal in width, filled with air and purulent mucus, the mucous membrane is pale and thickened, and the bronchial glands hypertrophied. Under the microscope the inter-alveolar tissue is seen to be dilated by a deposit of atrophied or fatty degenerated cells and granules, albumen, and fat-molecules; between these is found a slight amount of homogeneous basement substance. The mucous membrane of the small bronchi is uniformly infiltrated with a deposit of cells and nuclei, and in some places there are elevations with broad bases. The pleuræ of syphilomatous lungs are generally normal; the pulmonary tissue is firm, heavier, and only slightly dilatable. Köbner and Waldeyer have also noticed, in the lungs of hereditary syphilitic patients, numerous nodular gummata and diffused, inter-alveolar, small-celled granulation-proliferations.

Klebs thinks that intra-uterine *renal syphilis* is not infre-

quent, and he describes a case of this kind in which gummous deposits, containing granular tissue that had been transformed into spindle-cells, were found in the kidney.

Virchow claims that he has seen several times, in congenital syphilis of the new-born, enlargement and fatty degeneration of the *supra-renal capsule.*

In the cadaver of a boy six days of age Förster observed fibroid degeneration of Peyer's *intestinal glands*, which he presumes was the effect of hereditary syphilis. These glands projected above the level of the mucous membrane, the projection increasing toward the center of the plaque; the color was grayish-red, the upper surface dense and glossy. On section, the thickened patches were found to be hard, glossy, and gray, and could not be torn off from the unaltered muscular coat. The ulcers extended to the upper end of the ileum. Higher up ulcers in groups of twos and threes were found of four to six millimetres in length, while those in the ileum were mostly eight to twelve millimetres in length. The ulcers were oval or round; here and there they displayed a tendency to form a ring. There were no normal Peyer's patches to be seen. Simple inflammatory swelling of the solitary follicles, but no ulcers, were found in the colon. The mesenteric glands, and the small, firm spleen, were normal. The microscopical appearances were as follows: The hypertrophied projecting plaques consisted only of a dense network of connective tissue, which extended as a uniform layer from the upper surface to the muscular coat, and was quite poor in cells and granules. In the center of the plaque, where it appeared rough, the connective tissue broke down into a mass of finely granular détritus. The villi ceased at the borders; the cylindrical and lenticular glands were entirely absent.

Roth describes similar appearances found at the autopsy of a child five days old.

Schott states that he found, in the cadaver of a child that died with pustular syphilide, tumefaction of the intestinal glands, similar to that observed in scarlatina, typhoid fever, and, in rarer cases, in leukæmic conditions.

Mraçek found syphilitic affections of the small intestines in ten out of nearly two hundred cases. There were either

diffused inflammatory or typical syphilitic lesions, and the latter were partly in the form of infiltration around Peyer's plaques, partly in the form of irregularly scattered nodes and granules.

In both forms there were infiltrations of small cells into the intestines, the hyperplasia starting from the adventitia of small arteries. The occlusion of the caliber of the canal, caused by these infiltrations, interfered with a proper blood-supply to the part, and resulted in the degeneration of the deposits and nodes by anæmic necrosis.

In the brains of the cadavers of children that succumbed to congenital syphilis, and were examined by Schott, only one kind of alterations was found, namely, gelatinous tumors as big as a hazel-nut beneath both anterior lobes. A microscopical examination proved that their structure was similar to that of the tumors described by John Miller, and which Wagner found in the vicinity of the corpora quadrigemina in a person who died from puerperal fever. Broadbent seldom found the brain affected in infantile syphilis, and he believes that some cases of tubercular meningitis were mistaken for infantile syphilis of the brain.

Hutchinson has observed nervous affections in consequence of hereditary syphilis, which manifested themselves by convulsions with simultaneous kerato-iritis and atrophy of the optic nerve in a child eighteen months of age.

Hughlings Jackson saw a case of facial paralysis and paraplegia in a syphilitic child suffering from hereditary syphilis.

We found in a hereditary syphilitic child numerous gummata in the brain, and marked thickening of the right facial nerve.

Henoch saw several cases of affection of the *testes* in consequence of hereditary syphilis. According to Henning, morbid alterations may also occur in the *breasts* of children suffering from the hereditary disease.

In consequence of congenital syphilis, morbid alterations may occur in the *thymus* gland, in addition to those originating in the permanent organs. Paul Dubois found accumulations of pus in the thymus, especially in those infants who succumbed to a congenital pustular syphilide. In the year 1858

Widerhofer dissected a female infant that died from a pustular syphilide several hours after birth; after the removal of the sternum the thymus attracted attention by being almost double the normal size. Its external surface contained several spots about the size of millet-seeds, which, owing to its thin covering, permitted the purulent contents of these places to be seen. They appeared like small cavities. A longitudinal incision laid open a cavity of the size of a hazel-nut, whose apparently smooth walls contained a thick, yellowish, purulent fluid. Yellow, syphilitic nodes were imbedded in the substance of the liver. Wedl's microscopical examination corroborated the existence of a true abscess of the thymus gland.

Diagnosis and Prognosis of Congenital Syphilis.

Congenital syphilis in the infant can no more be recognized by *one* symptom than it can in the acquired variety in the adult. A positive diagnosis can only be made by passing in review the whole train of symptoms and studying the entire pathological picture and all the phenomena present.

The prognosis of congenital syphilis is extremely unfavorable. More than two thirds of the cases that die from syphilis belong to the congenital variety. The morbid lesions originating *in utero*, or shortly after the birth of the infant, observed by H. Zeissl, almost invariably terminated fatally. Pustular eruptions, grave cases of coryza, affections of the viscera, are the most dangerous symptoms. Infants in whom syphilis breaks out at birth, or shortly after, die sooner than those in whom the disease appears after the lapse of several days. Those who are brought up on artificial food die sooner than those who are nursed by a healthy mother or wet-nurse, and properly cared for. Congenital syphilis usually puts an end speedily to the precarious life of these new-born children by lobular pneumonia and exhausting diarrhœas, accompanied by bloody stools and vomiting. Infants, whose life is prolonged by judicious treatment, usually remain backward in their development, and retain marked indications of having passed through a serious disease, such as the caving in of the bridge of the nose, prominent frontal protuberances, opacities of the cornea, cicatricial lines radiating from the angles of the eyes,

mouth, nares, and anus (Hutchinson). Later marked peculiarities of character develop, and special tendencies to neuroses and mental disturbances.

Syphilis Hereditaria Tarda.

In rare cases syphilis that is inherited from the parents does not appear till many months, indeed, sometimes even many years, after birth. This form of inherited syphilis, described as *hereditaria tarda*, appears almost exclusively with the phenomena of the gummatous period of syphilis, which differ in no respect from that of acquired syphilis. As an effect of inherited syphilis appearing late in youth, the mucous membrane of the cheek, mouth, and fauces, especially, is attacked, and the hard palate becomes perforated. Similarly syphilis hereditaria tarda seems to have a special predilection for the mucous membrane of the nose, and not infrequently terminates in destruction of the cartilaginous, indeed, even the bony nasal framework. Gummata of the skin are comparatively rare, while periostitis, especially of the long tubular bones, occurs quite often. The diagnosis can only be established by ascertaining carefully the history of the patient, and by excluding acquired syphilis. The symptoms mentioned by Hutchinson—the peculiar indentation of the permanent incisor teeth of the second dentition period—in our opinion, is of no great value. We have never seen a case of hereditary syphilis which appeared after the age of nineteen years.

Treatment of Syphilis.

We will now describe in detail our views regarding the treatment of syphilis, which are corroborated by Diday, H. Zeissl, and Bärensprung. Like any other disease, syphilis may get well spontaneously in a long or short time; and if a spontaneous cure takes place, it is likely to be definite. Allowing syphilis to run its course spontaneously under a carefully regulated diet is called the *hygienic* or *expectant method* of treatment. In addition to the expectant method, there is the treatment of syphilis with mercury, iodine, and vegetable remedies. There is no doubt whatever that mercury will cause the symptoms to disappear very rapidly in the majority of cases.

But it is equally certain that when mercury is employed very early—as soon as the primary lesion is detected, or the first eruption appears—the symptoms then present will, it is true, speedily disappear; but obstinate relapses are more likely to follow than when syphilis is first allowed to spend its fury. In other words, mercury, if employed in the first few weeks of syphilis, will, it is true, soon dissipate the symptoms, but is no more able to annihilate the syphilitic diathesis in a short time than the expectant or iodine treatment — on the contrary, if used *too early*, it retards complete recovery. In our opinion, mercury should not be used till eight or ten weeks after the first eruption has appeared, unless the latter is too slow to disappear under expectant or iodine treatment, or dangerous phenomena threatening some of the organs of sense, the viscera, or the central nervous system supervene. We coincide in the opinion of H. Zeissl, "that it is not the mercury that is injurious, but the improper time chosen for employing it against syphilis."

True to the precepts of H. Zeissl's school, our method in the treatment of syphilis, briefly stated, is as follows: In patients affected with an initial primary lesion, but who are still entirely free from specific phenomena, such as glandular enlargement or eruptions, the treatment is confined to the local lesion.

If the first syphilitic phenomena appear upon the common integument in the form of a macular or papular eruption, we prescribe no anti-specific remedies for the patient, even when suppurating papules are present in the mouth, on the lips, or on the tonsils, but seek to expedite their involution, and to render them less painful by prohibiting the use of tobacco and cauterizing them with the solid nitrate of silver, or by penciling them with a solution of tanno-glycerine (tannic acid, 5·00 [℈iv], to glycerine 20·00 [℥ss., ℈iv]). If the eruption has not entirely disappeared at the end of eight weeks, or if no improvement is perceptible, we then prescribe the preparations of iodine.

If the symptoms of the disease have not entirely disappeared after the expiration of eight weeks more, the treatment with mercury may be resorted to without any fear concerning the future course of the disease. Our favorite remedies are

Zittman's decoction and the inunction of blue mass. By pursuing the course mentioned, a smaller number of inunctions are necessary to cause the symptoms of the disease to disappear than if a mercurial treatment is instituted from the beginning. We seldom employ mercury subcutaneously or administer it internally.

Another important question that presents itself to the syphilologist is, whether the treatment of the disease is completed when the symptoms that were present at the time the patient came under observation have disappeared. This question can only be answered by the statement that the disappearance of the symptoms is no proof that the diathesis has been eradicated; for otherwise no relapses would follow after a longer or shorter interval. We agree, therefore, most decidedly, with the French writers, especially Fournier and Martineau, that the treatment of syphilis should be continued as long as possible. True, it is not necessary that the patient be constantly under the eye of the physician; the subsequent treatment may, in fact, be left to himself, it being necessary to instruct him to apply for medical aid again as soon as any symptoms recur.

We think it is very important for the patient, even when all the symptoms of the disease have disppeared, to continue the treatment with iodine for a long time, at least for a whole year. If a patient desires to be treated with mercurial preparations, as is now and then the case, a cycle of ten to twelve inunctions may be tried during the first year, albeit no symptoms of syphilis manifest themselves. We know, indeed, from experiments which Hebra and H. Zeissl instituted, that even healthy persons tolerate large numbers of inunctions of mercury without the least injury. Taking this fact into consideration, we allow the patients, after the symptoms of syphilis have disappeared under the above-described method of treatment, to resort to the iodine baths at Halle, if their means and the season will permit. As soon as they return from the baths, iodide of potassium or sodium is again employed, with intervals of longer or shorter duration, depending upon the appearance of symptoms of iodism. But, if the circumstances are such that the patient can not travel to the baths, he should drink

iodine-water at home for a long time, and then go back to the use of one of the preparations of iodine.

So far we have been perfectly satisfied with the results obtained by the method of treatment described, the prolonged use of the iodides never having proved injurious to the patient. But, in view of the statement of Fournier and other authors, who assert that grave symptoms of affection of the central nervous system ensue in those cases of syphilis that have not been treated at all, or only insufficiently, we always prolong the treatment as much as possible. We are convinced that mercurial preparations play only a subordinate part in a course of anti-specific treatment continued for a year or more; but to treat syphilis with mercury for full five years, as some of the French physicians do, is hardly justifiable.

It is not safe to declare a patient permanently cured if at least a year has not elapsed after the last symptoms disappeared.

We will next say a few words regarding the prophylaxis of syphilis, and then describe in detail the expectant and other methods of treatment.

Prophylaxis of Syphilis.

We distinguish general prophylaxis, embracing whole countries, and one that has reference to the individual. The former belongs to the domain of sanitary police, and the student is referred to the literature on that subject.

Since syphilis has been better known, remedies have been sought which would afford protection against the absorption of the syphilitic virus, and would make the absorbed virus innocuous.

Quacks often pretend that they have many remedies capable of accomplishing this purpose; but none ever proved effective. The best protection, comparatively speaking, is derived from the use of the condom.

If a person apprehends that the syphilitic contagium has gained an entrance into his system through any point on the skin or mucous membrane, the physician can only suggest to him to take such measures of protection against the further effects of the virus as are employed against the absorption of

other pernicious matter (glanders, rabies, and soft-chancre virus). Strong caustics, such as penetrate deeply into the tissues, may be used for the purpose of destroying the poison at the place of entrance.

We know, from countless experiments with the virus of the soft chancre, that it can be made harmless to the system, if the place where it was deposited is thoroughly destroyed with caustics within three days. But the time in which the syphilitic virus can be rendered innocuous by destroying it with caustics has not yet been definitely ascertained by similar experiments. It was supposed that, since certain excoriations, that originate during intercourse, through which the syphilitic virus may take effect, were effectively cauterized within three days, the virus could certainly be destroyed by caustics within a few hours after it was absorbed, and thus rendered harmless. Unfortunately, most of the patients fail to notice the place of entrance of the poison into the system, and do not become aware of the fact till the specific primary lesion is fully developed, and is undergoing molecular degeneration—a process which, as a rule, takes place three weeks after infection has occurred, at a period, therefore, when the blood is already contaminated. The best agents with which to cauterize the place where the virus penetrated is caustic potash and Vienna paste.

Mercurial treatment will not protect one against the origin of syphilis, for even persons who are engaged in pursuits where a great deal of the mineral is used—for instance, mirror-platers, gilders, and others—are not proof against the disease, as has been found by experience.

An English physician (Wilks) propounded the question whether syphilis could be aborted. The deliberations of a commission resulted in the conclusion that it was totally useless to remove a Hunterian primary indurated lesion, since secondary symptoms would nevertheless appear. Sigmund and Ricord came to the same conclusions; the latter says the induration is not to be regarded as the cause (origin) of syphilis, but as the effect of the constitutional affection. Quite recently, many physicians have again taken up the subject, and stated that they have obtained *good results by excising the pri-*

mary lesion; that is to say, no secondary syphilitic phenomena ensued. Of the authors referred to, Auspitz and Unna, Kölliker, Hueter, Chadzynski, and Ferari are the most prominent. Auspitz and Unna deserve credit for having lately given new impetus to this question.

But we have convinced ourselves, by a great many experiments, that extirpation of the indurated primary lesion, however early performed after infection, does not prevent the outbreak of secondary phenomena. Quite recently, H. Zeissl had an opportunity of observing a striking instance, in which the initial indurated lesion was excised with apparent success, so that, according to the statement of the patient, some of the most prominent of the French syphilographers, Bassereau, Fournier, and Ricord, considered the infecting focus as having been completely destroyed, and yet, three months after the operation, secondary phenomena appeared in the form of erythema papulosum on the general skin, although there was no possibility that the patient had been reinfected. At the time the patient presented himself to H. Zeissl, the erythema was in full bloom. The striking case reported by Mauriac is especially convincing: A patient contracted a primary lesion which was excised fifty hours after it appeared, and, although no inguinal glandular enlargement was present at the time of excision, yet general secondary syphilis ensued. This and other facts have led us to doubt the effectiveness of the abortive treatment of syphilis, and to assert that if there is such a condition as an incubation period of syphilis, it is of very short duration. The excision of the specific primary lesion will not prevent the development of constitutional manifestations, whether the adjacent lymphatic glands be swollen at the time of the operation or not.

We will also remark that it is doubtful whether even the earliest cauterizations of the infecting initial lesion (Hunterian induration) are of any use, as a preventive measure against constitutional syphilis, because, in the course of an extensive practice, we have seen repeated instances in which, according to the statements of reliable physicians and patients, the sores were cauterized within a few hours after coitus, and yet the initial indurated lesion with all its consequences followed.—

The imperative duty devolves upon the physician of exercising the utmost caution in procuring the purest vaccine lymph for the purpose of vaccinating infants and revaccinating adults, and the same precautions should be employed in selecting a wet-nurse. Those about to marry, too, might be none the worse if they submitted themselves to a careful examination by the physician.

Treatment of the Initial Phenomena of Syphilis; the Hunterian Indurated Chancre; and Indolent, Multiple, and Strumous Buboes.

The treatment of the initial lesions of syphilis is similar to that of the other manifestations of the disease. Sometimes, however, they require special measures, because they frequently cause (local) disturbances and complications that can not be relieved speedily enough by the general treatment.

The site of a *syphilitic infecting* chancre requires a different local treatment according as it is also the site of a soft chancre or not. In the former case, the chancre should be treated in the same manner and with the same remedies, regardless of the induration, as if it were situated upon a non-indurated base or non-syphilitic person. In the second case, the local treatment is only intended to aid the cicatrization of the sore, which is desirable, because the Hunterian chancre, so long as it is uncicatrized, causes more or less pain; and, in case it is contaminated with impurities, it is apt to assume a condition of phlegmonous inflammation that may spread to the adjacent skin and lymphatic glands of the vicinity. Especially is it desirable to cause those Hunterian chancres to cicatrize that are situated upon the internal surface of the mucous membrane of the prepuce, in or near the fossa coronaria, and in females at the introitus vaginæ, because they frequently give rise to protracted balano-blenorrhœa and vulvar blennorrhœa; further, those on the lips, at the anus, and meatus of the urethra, because they occasion pain in speaking, defecation, and urination. The cicatrization of the initial induration is expedited by keeping it clean, by the application of iodoform dressing, or emplastrum hydrargyri. If the Hunterian chancre on the mucous membrane of the prepuce has occasioned phi-

mosis, some tolerably strong astringent, or slightly caustic preparation, such as a solution of carbolic acid or chlorate of potash, should be injected between the foreskin and glans penis several times daily. After this, bits of muslin, dipped in the same preparation, should be inserted under the former for the purpose of keeping the inflamed parts asunder. If this does not answer, circumcision will be required. If the Hunterian chancre is situated at the lips of the urethral meatus, it should be touched daily with nitrate of silver, and a small wedge of emplastrum hydrargyri inserted between the lips. The same method should be pursued in chancres at the anus or vulva. Hunterian indurated lesions situated on the skin of the penis, labia majora, or fingers, cicatrize quickest when they are covered with adhesive or mercurial plaster.

Indolent buboes of the size of a hazel-nut require no local treatment. The treatment directed against the general disease usually suffices to reduce them in size or to bring about resolution. If the indolent bubo accompanying the syphilitic initial lesion undergoes suppuration, it should be treated, *cæteris paribus*, like any other suppurating glandular abscess; but if the syphilitic, indolent buboes, fostered by the scrofulous or tuberculous tendency of the patient, or by ulcerating or moist papules in the vicinity, gradually increase, notwithstanding the general treatment already instituted, an effort should be made by appropriate local treatment to prevent suppuration, because of the fistulous passages that usually result from inflammation of the hyperplastic enlarged glands (strumous buboes). The reader is referred to what has already been said upon this subject on page 141. In some cases we succeeded in gradually diminishing these adenopathies by several subcutaneous injections of a few drops of tincture of iodine. A concentrated solution of nitrate of silver, or compresses dipped in a concentrated solution of basic acetate of lead, or iodide of lead-plaster, tincture of iodine, belladonna, or gallic acid, will be found useful. The following is one of the best preparations:

℞ Aqua destil., 20·00 [℥ ss., ʒ iv];
Nitr. arg. cryst., 5·00 [ʒ iv].

M. S. The glandular swelling to be penciled twice daily with a camel's-hair brush.

Emplastrum de Vigo cum hydrargyri will usually cause a diminution of strumous buboes.

If the strumous bubo, *per se*, does not prevent the patient from walking, it is not absolutely necessary that he should remain in bed; indeed, a moderate amount of exercise out-of-doors seems to hasten resolution.

If fluctuation has been detected at any place, the efforts to bring about absorption should not yet be abandoned, nor the abscess opened immediately, because experience has shown that even indolent buboes that fluctuated distinctly were nevertheless made to undergo resolution by the continuous application of tincture of iodine, lead-plaster, etc. Not till a prolonged trial of the above-mentioned remedies causes no diminution of the swelling, on the contrary, seems to increase it, make it more tense, and give the patient severe pain, may the spontaneous bursting of the abscess be expedited by the application of cataplasms, etc.; or it may be incised with a sharp-pointed bistoury. The part of the skin that has become thin, red, and undermined may be removed at once with the scissors. The opened indolent bubo should then be treated in accordance with the rules of antiseptic surgery. If fistulæ form, the measures advocated on page 142 may be adopted.

Treatment of Secondary Phenomena of Syphilis.

(A.) Expectant Method.

The expectant plan of treatment consists in regulating the diet of the patient, and in the local application of remedies to the primary lesion, none being administered against the general specific disease. If the primary lesion has begun to suppurate, the patient should be prohibited from taking active exercise, in order to avoid the risk of causing suppuration in the inguinal glands; if it has cicatrized, or did not suppurate at all, the patient should be in the open air as much as possible. He should avoid catching cold, abstain from the use of tobacco, and partake of nutritious food, especially meat. He may be allowed a moderate amount of wine and beer, but tobacco should be prohibited absolutely, because the irritation produced by its use will occasion the formation of syphilitic

efflorescences on the mucous membrane of the mouth, tongue, and fauces. It is highly important for the patient to wash the anal region with water after each stool. In corpulent persons contiguous parts should be kept asunder by the interposition of bits of lint. The constant contact of two opposing surfaces, as at the anus, groin, etc., always produces considerable moisture, and this results in the development of papules.

If secondary phenomena, in the form of a macular or papular syphilide, have finally appeared, the physician should still content himself with carrying out these hygienic measures. Syphilitic phenomena last a variable length of time in different persons. Roseola undergoes resolution without medication quite rapidly. In one case we saw it disappear within seven days. Papular syphilides often require a long time to undergo involution. Psoriasis palmaris and plantaris frequently require, if not treated, ten to twelve months before they disappear by resolution. An equal length of time often elapses before the syphilitic initial induration completely subsides. But it should not be forgotten that similar conditions are often seen in persons who undergo active mercurial treatment. We have observed that the individuality exercises considerable influence over the rapidity with which the syphilitic symptoms disappear. In general, it may be said that the cure of syphilis in anæmic and weak persons takes a longer time and is more difficult than in the robust and well-nourished. In regard to pustular syphilides, these, too, often require, under expectant treatment, seven to eight months to disappear by resolution.

The expectant treatment has taught us, on the one hand, that constitutional syphilis will follow even if not a particle of mercury is used, and, on the other hand, that the assertion of the anti-mercurialists, that the so-called secondary and tertiary syphilis are only the manifestations of the mercurialization, is not true. Relapses and the gravest forms of syphilis (symptoms denoting lesions of the central nervous system, of the viscera, etc.) may supervene just as well after a strict and scrupulously carried out expectant plan as after an anti-specific treatment. We only wish to say that these phenomena occur comparatively rarely after expectant treatment, and that re-

lapses are apt to occur less often than after an *early* mercurial treatment. If serious syphilitic symptoms have appeared, such as affections of the brain or eye, the anti-specific. remedies should be employed *at once*, and the life of the patient or the integrity of an important organ should not be endangered by delay.

All recent cases of acquired secondary syphilis are well adapted for treatment by the expectant method. If a febrile disease—pneumonia, dysentery, typhoid fever, etc.—supervenes upon the specific phenomena, mercury, iodine, and all depressing remedies must be discontinued, and the syphilitic disease treated with expectants for the time. In very severe forms of pustular syphilide similar indications prevail. Little can be hoped for from the expectant method in cases in which, after a long or short use of specific remedies, especially mercury, a relapse ensues. Cases of congenital syphilis which appear in youth, and are likely to cause destruction of some of the soft or bony parts (lupus syphilitica), are not adapted for the expectant method of treatment.

If the phenomena of the second period have resisted this method for eight or ten weeks, the treatment with iodine may be commenced. The treatment with preparations of iodine is adapted *to all phases* of syphilis, and, according to H. Zeissl's experience, the results derived from it are second to those of the expectant procedure, since relapses occur less often after an early treatment with iodine than with mercury.

Iodine in proper quantities, in conjunction with a carefully regulated regimen, are sufficient to *cause the symptoms of syphilis to disappear, or at least to be weakened so that only a few mercurial inunctions will be necessary to complete the cure, without fear of a relapse occurring in years to come.*

In pregnant women the symptoms of syphilis resist treatment much more than in non-pregnant women, especially if pregnancy is as old as the infection; they do not disappear entirely till the contents of the uterus have been expelled. We were, therefore, always obliged to continue the treatment with the preparations of iodine after the confinement, and, where this remedy proved insufficient, a few inunctions of mercury completed it.

Therapeutical Application of Iodine and Iodine-Salts against Syphilis.

(B.) Medicinal Treatment.

Since 1822 iodine has been used with good results in syphilis by Formey, Brera, Lugol, Cullerier, and Ricord; but it became famous as an antisyphilitic remedy mainly through the writings of Professor Wallace, of Dublin, who, in the year 1836, published a report of one hundred and forty-two cases treated with iodide of potassium, in which he obtained most favorable results.

We employ mainly iodide of potassium, iodide of sodium, iodide of iron, iodoform, and iodide of lithium. Pure iodine, which, owing to its corrosive action, is not adapted for internal use, may be given in the form of tincture. Of the latter we prescribe 1·00 [grs. xvj] to 100·00 [℥ iij, ʒ iij] water, and allow the patient to take two teaspoonfuls a day. Of iodide of potassium or sodium we order 1·00 [grs. xvj] either in solution or pill. The latter is preferable, because the bad taste of the medicine is thus avoided. *En passant*, we will state that iodide of sodium is less disagreeable than iodide of potassium. We use iodide of iron, either in the form of pills or sirup, as follows:

℞ Ferri iodat., 10·00 [ʒ viij];
Extract. et pulvis trifolii fibrini āā
q. s. ut ft. pilulæ No. 100.
Consperge pulvere eodem.
S. Ten pills, to be taken daily.

℞ Syr. ferri iodat., 2·00 [grs. xxxij];
Syr. mororum, 20·00 [℥ ss., ʒ iv].
M. S. To be taken in one day.

Iodide of iron is especially adapted for the treatment of syphilitic patients who are markedly anæmic. A gramme [grs. xvj] of iodide of iron daily, in pills, is very well tolerated; we have often given as much as 2·50 [grs. xl] without causing any digestive disturbances. In very weak patients, whose digestive organs are not strong, the sirup of the iodide of iron may be prescribed, but only in quantities necessary for each day, as it easily decomposes, and the free iodine then produces

pain in the stomach and vomiting. The decomposition of the iodide of iron is prevented in Blancard's pills, which are wrapped up in balsam of Tolu. Each pill contains 0·07 [1⅛ gr.], of which the patient takes four or five each day. Much benefit is derived from the internal use of iodoform, according to H. Zeissl's method. It is prescribed in pill-form:

℞ Iodoform., 1·50 [grs. xxiij];
Ext. et pulv. trifolii fibrini āā ut ft. pil. No. 20.
Consperge pulvere eodem.
S. Five pills to be taken daily.

Good results are obtained from iodoform, especially in cases of neuralgia caused by syphilis. In addition, we only wish to mention here that patients, after the internal use of iodoform, sometimes suffer for a long time from unpleasant eructations. It should not be prescribed in large doses; some physicians have seen intense excitement and mental disturbances arise in patients to whom large quantities of the drug were administered.

Iodide of lithium, which till now has not been much noticed, may be given in doses similar to those of iodoform. We have used it for several months, injecting it subcutaneously. It forms a perfectly clear solution when dissolved in water; 1·50 [grs. xxiij] may be injected hypodermically. The patients complain of pain at the site of injection, but it soon subsides. In this manner the preparation is very well tolerated, producing no other unpleasant effects except a moderate iodine acne in some cases. The involution of the syphilitic phenomena proceeded as rapidly as after the use of any other preparation of iodine. Iodide of lithium may also be administered internally in pills from 0·50 [grs. viij] to 1·00 [grs. xvj] per day. This preparation accomplishes as few miraculous cures as any other. Recently Thomann, of Gratz, and J. Neumann, injected iodoform in solution or emulsion hypodermically with good effect. As already said, all phases of syphilis are adapted for treatment with the preparations of iodine. We have seen numerous cases of iritis cured by the administration of iodine and application of atropine to the eye, not the least impairment of vision remaining in a single patient.

The rule that mercury causes the symptoms of syphilis in all cases to disappear more rapidly than any other anti-specific remedy, has but a limited application; in some cases both mercury and iodine act quickly, in others their effects upon the patient are very slow. Too much stress can not be laid upon the fact that even in the gravest forms of syphilis the preparations of iodine alone will often be found sufficient.

In regard to the subcutaneous employment of the preparations of iodine, it may be used with advantage in persons troubled with weak digestive organs; but this method will no more take the place of the internal use of the drug than the hypodermic injection of mercury has till now succeeded in replacing mercurial inunction. However slight the pains may be, the patients seek to avoid them if not absolutely necessary. Besides, it has the additional diadvantage that in private practice a syphilitic patient can not be seen every day.

Patients, whose health and other circumstances permit, should go at the proper season of the year to iodine mineral springs. There are several places in the Austro-Hungarian Empire where valuable iodine springs are found, such as Hall in Upper Austria, Ivonicz in Galicia, Lippik in Slavonia, Luhatschowitz in Mahren, and Darkau in Silesia. In these places the patients not only drink iodine-water, but also bathe in it. Professor Rosenthal, of Vienna, under the direction of Professor Schneider, has shown, in a paper presented to the Imperial Academy of Sciences in the year 1862, that iodine is absorbed into the blood by the skin.

It is a mistaken idea to prohibit the patient from partaking of articles of food containing starch during the treatment with iodine. Starch alone, without the simultaneous intervention of an acid, is not capable of separating the iodine from its compounds and forming a combination with it. The acids of the stomach are much too feeble for that purpose; and admitting that a partial decomposition of the iodides takes place from an excess of starch in the stomach, then only an iodide of starch would form, which is the very substance recommended by Buchanan against syphilis on account of its non-irritating action on the gastric mucous membrane. Equally little injury results to the patient, according to our experience,

from the decomposition of the preparations of iodine, owing to the use of acids during the treatment with iodides. Recently, English physicians have actually sought to increase the action of this remedy, and obtained favorable results from the combined use of tolerably strong acids (ozonized water, nitric acid) with preparations of iodine. The powerful action of the salts of iodine, in bringing about a metamorphosis of the tissues, is reason enough for allowing the patient, during the iodine-cure, to partake of as much nourishing diet, especially animal food, as possible, still the cure should not be made unnecessarily irksome by prohibiting the ingestion of bread.

The preparations of iodine, as already stated above, are adapted to all forms of syphilitic disease.

The iodides have proved especially efficacious against gummous periostitis and ostitis, gummata of the skin, tongue, respiratory organs, etc.; in muscular contractions, sarcocele syphilitica, specific eye, brain, and nervous affections, inherited syphilis, appearing in the shape of scrofulous manifestations, and in cases in which scrofula and syphilis are combined.

Still, there are cases in which all the morbid forms mentioned obstinately resist the action of the iodine remedies; in such, if the condition of the patient permits, we resort to the mildest of all mercurial preparations, Zittmann's decoction. The mercurials generally achieve more if they have been preceded by a course of treatment with iodine.

It follows, from what has been said, that the salts of iodine are the chief remedies for so-called tertiary syphilis. Still, it can not be denied that all the other specific phenomena may be made to undergo involution by the use of iodine; but it is equally true that there are exceptional cases, which can not be foretold, in which mercury may be advantageously substituted for the iodide.

When iodine preparations are used in appropriate cases and in proper doses, the appetite of the patient increases, and nutrition improves proportionally. Sometimes, however, the appetite increases to a ravenous hunger. Occasionally the internal use of the iodides causes *ringing in the ears* and *intestinal catarrh*, which sometimes is attended by loose stools, then again by constipation. The pathogenic action of iodine manifests

itself most strikingly upon the nasal mucous membrane, a violent nasal catarrh originating in most patients after this remedy has been used for two or three days. This phenomenon is generally accompanied by an irritated condition of the mucous membrane of the fauces and pain over the frontal sinus. The catarrhal affection of the mucous membranes mentioned extends to the lachrymal apparatus and Eustachian tube. More or less severe febrile movement, according to the sensitiveness of the patient, ensues. In most cases we noticed, in consequence of the continuous use of the iodides, marked redness and looseness of the gums of the upper incisor teeth (gingivitis), which persisted for many weeks, along with obstinate salivation. The pathogenic action of iodine salts manifests itself just as frequently upon the general skin as upon the naso-faucial mucous membrane. An *acne-like* eruption occurs in some persons, especially those having a tender skin, on the face, nape, shoulders, and upper arms. The iodine catarrh and acne may indeed occur simultaneously, but, as a rule, these two affections exclude each other. In some patients the use of the salts of iodine produces sleeplessness. In rare cases we have observed, in consequence of the internal use of the preparations under consideration, *episcleral* ecchymoses and *nævus-like* teleangiectases, as big as a pin's head, on the general integument. In some cases the *action of the heart* is accelerated to such a degree, by a prolonged use of this remedy, that the rapidity of the pulse is increased to one hundred and forty per minute, the patient being at the same time exceedingly irritable and exhausted. We also saw pleurodynia occasionally in consequence of the use of iodine—a phenomenon first pointed out by Wallace. The pain, which is usually limited to the left side of the thorax, is so violent at times as to hinder the patients from breathing, resembling very much in severity that occurring in true pleurisy.

Iodine catarrh and iodine acne disappear when the iodides are discontinued. For the relief of the gingivitis, the astringent mouth-washes recommended against mercurial stomatitis may be used. The ravenous hunger and sleeplessness, the pleurodynia, and increased action of the heart are markedly diminished by an active purgative (Saidschützer or Püllnaer

bitter-water), and disappear entirely after the use of a few doses of quinine, 0·3 to 0·4 [grs. v to vij] daily.

The Treatment of Syphilis by Vegetable Remedies.

Of the vegetable remedies, we will only mention tayuya, pilocarpine, and Zittmann's decoction. Tayuya-tincture has been recommended by the Ubicini brothers. It is prepared from the root or bulb of one of the cucurbitacea plants. This remedy was used in the form of subcutaneous injection, and also internally in H. Zeissl's hospital division. The results were such that it may be said that time and not the remedy accomplished the cure. However, it exercises no injurious effect upon the system. Lewin made numerous experiments with *pilocarpin*, the alkaloid of jaborandi. He used the muriate, and treated thirty-two women with it by hypodermic injections; twenty-five of the patients were cured. In three of the seven that were not cured, such violent symptoms of collapse appeared that the treatment had to be discontinued. One patient was attacked by hæmoptysis—in another endocarditis supervened. In two others the syphilitic manifestations did not disappear, notwithstanding the large doses of pilocarpine employed. The longest time required for a cure was forty-three days, the shortest fourteen. Lewin thinks that a cure could be achieved in a still shorter time, if it were not necessary to suspend the treatment, even when no accidents occurred, on account of the patients' being frequently very much affected by it. The average quantity of pilocarpine required for a cure is 0·372 [grs.vss.].

The relation of pilocarpine to the different forms of syphilis is pretty much the same as that of mercury. The relapses in these twenty-seven patients amounted to only six per cent, against eighty per cent after a vegetable cure or previous treatment with mercury. Nevertheless, Lewin gives the preference to hypodermic injections of corrosive sublimate over the treatment with pilocarpine, for, although the percentage of cures with the latter is decidedly greater, yet the use of the remedy is attended by such unpleasant symptoms. In some cases in which we employed hypodermic injections of pilocarpine the unpleasant effects were so violent that we had to abandon all

further treatment with it, especially since the curative effects were by no means satisfactory.

But from Zittmann's decoction we have seen very brilliant results. It is difficult to say whether this remedy should be classed among the vegetable or the mercurial preparations. In preparing this decoction, as is well known, 1·00 [grs. xvj] of white sugar, a like quantity of powdered alum, 0·8 [grs. xij] powdered calomel, and 0·2 [grs. iij] powdered cinnabar, are boiled in a little bag with sarsaparilla. Mitscherlich was unable to detect any mercury in the decoction, while Zanten, Wiggers, and Winkler found traces of it in large quantities of the preparation. Skoda found Zittmann's decoction less efficacious when calomel and cinnabar were omitted. For these reasons, we have to assign to Zittmann's decoction a hybrid position between the vegetable and purely mercurial remedies. We order the patient to take 300·00 [℥ ixss., ℈iv] of decoct. Zittmanni fortius every morning, and the same quantity of the weaker decoction in the evening. At the same time the diet must be strictly regulated. He should drink no liquor, beer, or milk. Fruits, salads, all kinds of vegetables and fruits—in a word, everything that is likely to cause diarrhœa and flatus—must be strictly prohibited. At 7.30 A. M., the patient takes his breakfast, consisting of a cup of black tea and toast. Half an hour after, he begins to drink the decoction, which he finishes in the course of half an hour to two hours. Generally, from one to three evacuations from the bowels then occur in the course of the forenoon. At one o'clock he takes his dinner, consisting of soup, roast beef, and rice, with a glass of wine, and, if the weather is pleasant, he may take some exercise out-of-doors, and, at 4 P. M., drinks a second bottle of the (weaker) decoction, likewise consuming it in the course of half an hour to two hours.

If the patient has five or six evacuations daily, he may continue to take the decoction; but if they become too frequent, and perceptibly reduce him, or vomiting ensues, the remedy must be immediately discontinued. In the majority of cases, not more than three or four evacuations take place daily, the decoction agreeing very well with most patients. The effects of the remedy usually become manifest after using it ten or

twelve days; it has an exceedingly favorable effect upon all forms of syphilis, but is especially applicable in patients who are somewhat exhausted by a severe course of mercury, and in whom the syphilitic disease obstinately resists the preparations of iodine. It is an indisputable fact that, in patients who had been treated early and for a long time with mercury, obstinate relapses of the syphilitic disease, in the form of psoriasis palmaris or plantaris, will not disappear at all, or but very slowly, under the use of the iodides, the malady improving only when mercury is again administered. But, if it be not deemed proper to give such patients more mercury, because they are already reduced by the preceding active treatment with it, Zittmann's decoction may be prescribed. Truly wonderful effects may be expected from it, though such an expression ought not to be used in the practice of medicine at the present day. It renders excellent service in diffused pustular syphilides, and in suppurating gumma-nodes, whether situated upon the common integument or the mucous membrane. If the decoction occasions violent colic-pains or profuse diarrhœa, and its further employment is indicated notwithstanding, it will be well to omit the senna-leaves from the preparation.

[The formula given above for the preparation of Zittmann's decoction being incomplete, that described in the United States Dispensatory is here appended: Take of sarsaparilla twelve ounces, spring-water ninety pounds; digest for twenty-four hours, then introduce, inclosed in a small bag, an ounce and a half of sugar of alum (consisting of equal parts of white sugar and powdered alum), half an ounce of calomel, and a drachm of cinnabar. Boil to thirty pounds, and, near the end of the boiling, add of anise-seed, fennel-seed, each half an ounce, senna three ounces, liquorice-root an ounce and a half. Put aside the liquor under the name of the *strong decoction*. To the residue add six ounces of sarsaparilla and ninety pounds of water. Boil to thirty pounds, and, near the end, add lemon-peel, cinnamon, cardamom, liquorice, of each three drachms. Strain, and set aside the liquor, under the name of the *weak decoction*.]

Therapeutic Use of Mercury.

Mercury may be introduced into the system in two ways—through the mucous membrane of the digestive and respiratory

organs, and through the general skin. Now, if in the patient who is about to be treated, one of these ways become unavailable, in consequence of syphilis itself, or because of some morbid alterations or complications, it will be necessary to find some other course whereby the mercury may be introduced into the system. Further, if it is the intention of the physician to produce a mild and gradual therapeutic effect, and if the digestive organs of the patient are in a good condition, the latter may be employed. But if he desires to introduce a large quantity of mercury into the system in a short time, the external skin is certainly best adapted for that purpose. If it is desired to produce a direct specific effect upon the respiratory organs, mercury may be inhaled in the form of vapor.

Mercurial Preparations which are best adapted for Introduction into the Blood through the Digestive Organs.

Although we entirely agree with Mialhe in his theory that all preparations of mercury introduced into the system must, before developing their therapeutic effects, become converted into corrosive sublimate, and hence that it would seem to be more advantageous to use the bichloride at once, nevertheless, we must say that the other preparations of mercury are by no means to be discarded. Experience has shown that some persons are apt to suffer from gastric pain after taking corrosive sublimate, while the protoiodide of mercury or calomel agrees with them very well indeed. It therefore seems as if some persons tolerate better the sublimate that forms within their systems from the protoiodide or calomel than when it is administered to them directly.

Most German physicians at present prefer corrosive sublimate to any other preparation of mercury, because it so seldom produces ptyalism, while this unpleasant by-effect almost always attends the use of the protoiodide, calomel, and mercurius solubilis Hahnemanni. The salivation which sometimes supervenes very rapidly upon the use of mercurial preparations seems to us to be due more to individual idiosyncrasy than to the chemical properties of the drug; hence the reason why some of the most accomplished physicians differ so much upon this point.

Hydrargyri protoioduretum, iodide of mercury, a greenish insoluble combination of iodine with mercury, is especially recommended by Ricord, and adapted in cases in which the primary induration still exists, in recent erythematous and papular syphilides, and in psoriasis palmaris and plantaris disseminata. As a rule, the involution of the specific efflorescences on the skin and mucous membrane begins after using the protoiodide for two or three weeks. The papules on the palms of the hands and soles of the feet offer the most obstinate resistance to the action of the remedy, and local applications will almost always be required to assist the protoiodide in discussing them.

The dose of the protoiodide is 0·02 to 0·04 [gr. $\frac{1}{3}$ to $\frac{2}{3}$]. Generally, patients who take 0·10 [gr. $1\frac{2}{3}$] of this remedy in twenty-four hours have two or three liquid evacuations, attended by colic-pains. To prevent the latter, the mercurial should be combined with extract of lactucaria or opium in the following manner:

℞ Protoiod. hydrargyri:
Extr. lactucarii, āā 1·00 [grs. xvj];
Opii puri, 0·50 [grs. viij];
Extr. et pulv. rad. liquiritia, āā q. s. ut ft. pil. No. 50.
S. One pill to be taken in the morning and two in the evening.

So long as the protoiodide exercises a perceptibly favorable effect over the induration or the other syphilitic manifestations present, and the mucous membrane of the mouth remains unaffected, the dose recommended above may be continued. But, if the improvement of the syphilitic lesion is arrested, two pills should be given in the morning and two in the evening. Should the patient's gums become red and swollen, and his breath acquire a repulsive odor, the remedy will have to be discontinued till the mucous membrane regains its normal condition. If the protoiodide, despite the addition of the narcotic, causes intense colic-pains; if profuse, liquid, or, still worse, bloody stools take place, the internal use of all kinds of mercury should be suspended, and the patient subjected to an inunction-cure, or the iodides may be prescribed.

Chloride of mercury, being soluble, is a more useful remedy than the protoiodide; still, it can only be used internally in

persons who have perfectly healthy digestive organs and sound respiratory apparatus. There are patients in whom the use of corrosive sublimate occasions gastralgia, and for that reason the remedy must be replaced by one that is less useful. In persons who have already suffered from attacks of hæmoptysis, mercury in general, but especially corrosive sublimate, should be used cautiously. If albuminuria is present, large doses of the bichloride act equally unfavorably. No corrosive sublimate, and, still less, other drastic mercurial preparations, should be prescribed for syphilitic pregnant women. The treatment of syphilis with corrosive sublimate was introduced into Western Europe by Van Swieten, from Russia. The Russians take this medicine in corn-whisky (liquor Van Swietenii).

Adult patients readily tolerate a dose of the sublimate of 0·005 to 0·02 [gr. $\frac{1}{12}$ to $\frac{1}{3}$] per day. As a rule, it is best to continue to the end of the sublimate cure with a dose of say 0·010 [gr. $\frac{1}{6}$] per day. But if the syphilitic phenomena remain at a standstill for several days, and there are no contra-indications in the constitution of the patient against larger doses of mercury, it may be increased gradually at the end of three or four weeks to 0·012 or 0·015 [gr. $\frac{1}{5}$ to $\frac{1}{4}$]. It is better to administer it in the form of pills than dissolved in water or alcohol. The following is the most convenient method:

℞ Mur. hydrarg. cor., 0·10 [gr. 1½];
Solve in pauxillo æther sulph., et adde
Pulv. amyli q. s. ut ft. pil. No. 20.
D. S. One pill to be taken morning and evening.

℞ Mur. hydrarg. cor., 0·10 [gr. 1½];
Aqua destil., 300·00 [℥ ixss., ʒ iv].
M. S. One tablespoonful to be taken morning and evening.

For the purpose of preventing the gastralgia and the colic-pains, the patient should avoid taking the medicine, especially his morning dose, on an empty stomach; a bowl of broth or milk should always precede it by about half an hour. If the patient is in the habit of drinking tea, morning and evening, then the following may be prescribed:

℞ Rhum. optimi, 20·00 [℥ ss., ʒ iv];
Sublimat. cor., 0·10 [gr. 1½].
M. D. S. Twenty drops to be taken in the tea, morning and evening.

We seldom prescribe calomel or submuriate of mercury; in fact, only in such cases in which we desire to administer large doses of mercury through the digestive system in a short time. In dangerous iritis especially, and in specific affections of the fauces, calomel has proved to be one of the quickest remedies to produce good effects. In adults it may be given in the following form:

℞ Calomel lævigati, 0·50 [grs. viij];
Opii puri, 0·10 [gr. 1½].
Sacchar. alba, 5·00 [ʒ iv].
M. Div. in dosis No. 12.
D. S. One powder to be taken morning, noon, and night.

On the whole, we have used very little sublimate or submuriate of mercury for many years past, because we have convinced ourselves that no other preparations will produce such peculiar and obstinate alterations of the epithelial cells of the mucous membrane of the mouth and tongue as these, especially if the patient is addicted to the use of tobacco. In these patients there are found most frequently on the mucous membrane of the tongue, lips, and cheeks, especially on the places that come in contact with the angles of the teeth, pearly-white, opalescent opacities of the epithelial cells, varying in size from that of a pin's head to that of a bean, which may be either scattered or aggregated. These places look as if they had been touched with nitrate of silver. They are distinguished from mucous-membrane papules by the absence of diphtheritic slough upon them; they do not ulcerate, display no local proliferation of the papilla, often terminate in retractions of the affected places of the mucous membrane, because, in consequence of the pressure of the epithelial thickening upon the affected papillæ, the latter retract, while the epithelial opacity is so persistent that it remains unaltered for many years. In accordance with an article published by Wiensky, a Russian physician, who on injecting cinnabar into the blood of animals found it again encysted in the epithelial cells, H. Zeissl feels justified in asserting that the opacities spoken of are nothing more than epithelial cells containing mercury. In proof of this view, we can say that we never saw these persistent opacities in persons who were not treated with corrosive sublimate.

As an additional proof, we may point to an analogous alteration of the epithelial cells seen in the blue color on the gums of persons who handle lead, and in the bronzing of the skin and buccal mucous membrane produced by the internal administration of nitrate of silver. As the internal employment of mercury is generally adopted in the treatment of recent manifestations of syphilis, that is to say, at a time when the indurated infecting places are still suppurating and the indolent buboes are still progressing, it will be well for the patient to avoid all active exercise, though it is not necessary that he should stay in bed. Furthermore, as the patient frequently suffers from rheumatoid pains at the beginning of syphilis, he should not expose himself unnecessarily to sudden changes of temperature, and especially should he protect himself against cold and damp night-air. It is even beneficial for him to sweat some at night. Under moderate diaphoresis, the disease not only runs a favorable course, but the internal use of mercury is better tolerated. For this reason, most physicians order the patient to take a larger dose of mercury on going to bed than at other times.

In regard to the diet, the patient may be allowed to take a moderate amount of nourishment; it is only necessary for him to avoid all kinds of vegetables and fruit that cause flatus, and all articles that contain vegetable acids, lemonades, etc., which are incompatible with the remedies, and readily give rise to nausea, colic-pains, and diarrhœa. If calomel is used internally, the patient should not be allowed to partake of very salty food, such as salt herring, or drinks containing soda; nor of ammonia, because the composition of the calomel is thereby liable to be changed, and, it is claimed by some physicians, that sudden deaths have resulted from it. He should renounce the use of tobacco in every shape absolutely during the treatment with mercury, especially when the sublimate is used. How long a time is required to accomplish a cure with mercury, and how much of the different preparations is necessary to completely annihilate syphilis, depends upon the individual case. As a rule, the mercurials should be administered to the patient, if he tolerates them, till all the symptoms have disappeared, which will seldom occur in less than two or three

months. Accordingly, a patient will consume about 4·00 [grs. lxij] of the protoiodide, or 0·5 to 1·00 [grs. viij to xvj] of corrosive sublimate. The treatment must be suspended, at least for a time, as soon as the mucous membrane of the mouth is affected, and the patient should rinse his mouth with some astringent preparation every half-hour.

External Application of Mercury and its Preparations.

The absorption of mercury into the blood through the skin can be accomplished in the following manner:

(*a*) By repeated inunctions of salve, containing mercury, over a large portion of the skin (epidermatic mercurial treatment).

(*b*) By injections into the subcutaneous tissue (hypodermic mercurial treatment).

(*c*) By the action of vapor of mercury through the skin.

(*d*) By the use of mercurial baths. And, lastly—

(*e*) By the local use of mercury in the form of suppositories upon the mucous membrane of the rectum.

(*a*) *Mercurial Inunction Treatment.*

The method of treating syphilis by means of mercurial ointment came into vogue at the very beginning of the epidemic of syphilis in Europe; but even the systematic directions laid down for its application by Louvrier and Rust at the beginning of this century led to so much misuse, that all sensible physicians denounced it.

Our method of employing the inunction-cure is the following: We begin the inunctions without any special preparations, simply allowing the patient to take a lukewarm bath. We order from two to five grammes [3 ss. to 3 jss.] of blue-ointment for each inunction. The inunctions may be performed by the patient himself, or by an attendant with leather gloves upon his hands. They may be resorted to daily, or every second or third day, according to the intensity of the syphilitic lesion and the constitution of the patient, and are carried out in the following order upon the various parts of the body:

On the first day of the treatment the ointment is rubbed in on the anterior surfaces of both arms; on the second day,

on the anterior surfaces of both thighs; on the third day, on the anterior surfaces of both forearms; on the fourth day, on the anterior surfaces of both legs; on the fifth day, on both loins; on the sixth day, on the back; on the seventh day, the order of arrangement is begun anew. The patient should thoroughly rub in the whole dose of the salve, taking care that none of it remains in lumps upon his hand or upon the body. The hairy parts of the body should be avoided as much as possible, because the inunctions are there apt to produce an eruption of small pustules, an inflammation of the apertures of the hair-follicles. If the patient's hands are tough and callous, he should put on a pair of tight-fitting leather gloves wherewith to perform the inunction.

In unpleasant weather the patient should remain in his room; but when the weather is favorable, especially during the warm season of the year, he should spend the greater part of the day out-of-doors. During the cold season, the temperature of the room should be 15° or 16° Réaumur [66° or 68° Fahr.], and, if possible, the apartment should be thoroughly ventilated twice a day.

The physician should pay special attention to the condition of the mouth of the patient. From the very beginning of the treatment, the latter should be instructed to rinse his mouth repeatedly during the day with pure water, or water containing some astringent remedy, such as chlorate of potash, alum, borax, tannic acid, laudanum, etc., 1·00 [grs. xvj] to 100·00 [℥iij, ℈viij] of water. In addition, he should prevent the formation of tartar on his teeth by brushing them several times daily with a soft tooth-brush and water.

In accordance with the views already enunciated, we only resort to the inunction-treatment in the advanced stages of the disease, and especially in those cases which resist the action of less powerful remedies—the iodides. All relapses of the first phase of syphilis, such as relapsing papular syphilides, psoriasis palmaris diffusa, impetigo, and ecthyma syphilitica, and partly, also, nodular syphilides, are particularly well adapted for treatment by inunction. In some cases certain special physiological and pathological conditions that may obtain will serve to determine the physician in preferring the inunction

method over any other form of mercurial treatment. Thus, it is vastly preferable to subject syphilitic pregnant, and puerperal women to an inunction-cure, than to administer mercury to them internally. Persons having feeble digestive organs, those suffering from suspicious laryngeal and bronchial catarrhs, from frequent gastro-intestinal catarrh, or those who only recently recovered from typhoid fever or dysentery, are more advantageously treated by inunctions than by the internal administration of mercury. Further, the morbid syphilitic conditions best adapted for the inunction-treatment are those which are complicated with constitutional or other affections that also require internal treatment—for instance, scrofula, tuberculosis, chlorosis, intermittent fever, etc. In these cases, cod-liver oil, iron, and quinine, may be employed in addition to the inunctions of mercury; but the inunctions are principally applicable in those cases in which *dangerous* symptoms supervene, because they afford such rapid relief: thus, in suppuration of the nasal passages, in iritis syphilitica, specific affections of the head, brain, and nerves, especially those that depend upon extra-cerebral morbid changes.

The number of inunctions that may be necessary varies, of course, according to the form and intensity of the disease; the individual condition of the patient; and, lastly, whether the patient had taken mercury shortly before beginning the inunction-treatment or not.

The treatment of syphilitic ulcers, nodular syphilides, and large tophi, will require more inunctions than that of a papular syphilide. In regard to the individuality, experience has shown that there are persons in whom the employment of this method, and the mercurial treatment generally, exercise a favorable influence upon the involution of the morbid phenomena in a very few days, while in others the lesions obstinately resist all kinds of mercurial medication. Fewer inunctions will be required if employed in conjunction with Zittmann's decoction than without the aid of the latter. We have seldom found less than twelve to sixteen inunctions sufficient, nor more than thirty required in the patients that came under our observation. If this number is not capable of subjugating the most essential features of the disease; still more, if an aggravation

of the syphilitic symptoms, or of the general condition supervenes, the treatment should be suspended for the time being, and an effort made by a proper diet and mode of living (sometimes by the intercalation of a moderate grade of cold-water cure) to invigorate the system. When this has been achieved, the inunctions of mercury may be resumed.

Sometimes it becomes necessary to suspend the inunction-cure for a time, owing to the supervention of certain physiological or pathological conditions. The physiological conditions referred to here are menstruation and confinement. The acute, febrile, contagious exanthemata, measles, scarlet fever, variola, acute inflammations of some of the organs, intense catarrhal or inflammatory affections of the intestinal canal, accompanied by exhaustive diarrhœas, may be classed among the pathological conditions. Above all, however, an intercurrent hæmoptysis in tuberculous syphilitic patients will require the immediate suspension of the inunction-treatment. But the application of the mercurial ointment *per se* not infrequently gives rise to morbid phenomena, which necessitate a suspension of the procedure. Stomatitis mercurialis is one of the most frequent pathogenetic effects of mercury; next in frequency are eczematous affections of the skin, occurring in hairy individuals on the places where the ointment is rubbed in, and in blondes with a tender skin over a larger part of the integument.

During the inunction-treatment the patient should be nourished with easily digestible food in quantities proportionate to his age, habits, and bodily conformation. We allow the patient in the morning either a cup of tea, coffee, or a bowl of broth or milk, with one or two slices of wheaten bread; for dinner, nutritious beef-soup, from fifty to seventy grammes [℥ jss., ℈ iv to ℥ ij, ℈ viij]; veal, or chicken, twenty grammes [℥ ss., ℈ iv]; rice boiled in milk or water, or some other digestible farinaceous food, or spinach in the same quantity; evenings, the patient gets another bowl of concentrated broth, with wheaten bread and coffee, chocolate, or milk. Special conditions, such as pregnancy, confinement, scorbutus, convalescence from typhoid fever, and intermittent fever, require special dietary regulations. Pure cold spring-water is the best drink

that can be recommended. In the hot season of the year the patients, especially scorbutic convalescents, may be permitted to drink lemonade or water flavored with some fruit-sirup. Those who have been greatly reduced in strength by a preceding typhoid or intermittent fever, loss of blood, or vicious mode of life, may be allowed to drink a proper quantity of good wine. During the inunction-treatment the patient's bowels should move at least once a day, because experience has shown that those suffering from constipation are more liable to be affected with salivation than those who are not constipated. If the bowels are sluggish, cathartics or some mineral water that contains sulphate of magnesia or Glauber's salts, such as Saidschütz, Püllna, Ofner, Elizabeth Spring, or the like, should be ordered. During treatment we often give a small quantity of Zittmann's decoction.

If no contraindication against the continuation of the inunction-treatment supervene, it should be prolonged till the physician has good reason to believe that the disease is entirely cured. The good effects of an inunction-cure, and of the internal use of mercury, soon manifest themselves by the fact that the patient loses his former cachectic appearance, gains perceptibly in weight, acquires a healthy color, and the evidences of the syphilitic diathesis capable of undergoing resolution disappear. So long as the circumscribed discolored spots have not totally disappeared, so long as the syphilitic scars have not become perfectly pale, so long as there is falling out of the hair and fragility of the nails, the patients can not be deemed entirely cured.

When the inunction-cure is completed, the patient should take one or more warm baths, protect himself against catching cold by remaining a few days more in a warm room, and then may gradually resume his usual mode of living. To avoid all possible risks of the effects of a lowering temperature upon the system that may have become sensitive during the treatment, several hot vapor-baths, with subsequent cold douching, or a moderate grade of cold-water treatment, may be recommended to the patient.

[The problem at the outset in the treatment of syphilis is to free the system of a poison that possesses the property of

tenaciously clinging to it and of undermining it for years, permeating all the tissues and fluids of the body. We must bear in mind that so long as the poison is active the natural recuperative powers of the body are insufficient to overcome the disease which has a tendency in many cases to be aggressive, progressing in its morbid changes, and, when left to itself, causing serious damage to many important organs. If the system is to be saved from permanent injury, if it is to be freed from the syphilitic poison and cured perfectly, the physician and patient must unite and continue their work together persistently until it is brought to a happy termination.

The antidotes to the syphilitic poison are mercury and iodide of potassium; upon that point there is no longer any question. The best authorities are now agreed that the disease can not be cured effectually without them. But they are only antidotes when properly handled. If given in insufficient doses, the disease soon obtains the mastery; if used in excess, they become poisons themselves. To hit the exact and happy medium, to avoid both dangerous extremes, we must not confine ourselves to strictly arbitrary doses, but administer them in quantities not only sufficient to control, but to eradicate the disease, in accordance with the requirements of each individual case, being ever ready to reduce the quantity or discontinue it entirely as soon as any untoward symptoms manifest themselves. At the same time we must avail ourselves of such other agents as will aid in bringing about the transformation of diseased into healthy tissues, by increasing their nutrition with healthy blood, and removing effete matter—i. e., by a generous diet, diaphoretics, tonics, etc.

To Von Sigmund belongs the credit of having pointed out the fact that in the treatment of syphilis with mercury we must not only not produce any signs of mercurial poisoning, but the more perfectly we guard the system against the toxic effects of this drug the surer shall we be to cure our patient of his syphilitic disease. In the vast majority of cases the inunction method is the best form of employing mercury, and, having obtained the most satisfactory results from it, I seldom use any other. In regard to the fear of patients taking cold during its employment, all I can say is that I have repeatedly

seen patients come to my clinic in inclement weather with a considerable amount of mercurial ointment still fresh upon their persons, having neglected to wash it off for days together (though they were cautioned against such a course)—many of them being insufficiently clad at that, without suffering any ill effects from it.

In the inunction-treatment, the following additional practical suggestions may be of value to the practitioner:

1. The body should be prepared to absorb the mercury, and a quantity of blue-mass used sufficient to produce an effect upon the syphilitic lesion.

The preparation of the body simply consists in the patient taking a warm-water bath before rubbing in the salve; he should remain in the bath from a quarter to half an hour. Poor patients who can not procure these baths should wash the part of the body upon which the salve is to be rubbed with diluted alcohol or vinegar and water, and afterward rub the part dry with a coarse towel; in fact, simply rubbing the skin with a coarse dry towel accomplishes the same object—of stimulating the absorbent powers of the skin—as the use of hot baths. Sometimes, however, various obstacles may intervene, such as mercurialization and febrile phenomena, caused perhaps by a local affection, which have to be removed before the patient can be subjected to the inunction method. Paradoxical as it may seem, yet it is nevertheless true that a patient may be brought to a state of mercurialization and stomatitis without being benefited in the least, and it will be necessary to cure him of these complications before it is possible to administer any more mercury to him. If the febrile phenomena are due to an intercurrent acute disease, or the patient has been intemperate, and indulged in excesses, it will be necessary to defer the inunction-treatment till his system has had an opportunity of recuperating somewhat, and been improved by proper restrictions, baths, tonics, etc.

I deem the manner of rubbing in the ointment of the utmost importance. Usually the patient takes a lump of salve and rubs it in upon his person without care or attention, leaving perhaps half of it in lumps on the skin or on his fingers. Naturally, little or no good is derived from such inunctions,

the disease remaining unaffected—nay, more, often progresses unchecked. I therefore give him explicit instructions to rub the salve into his groins, thighs, or axillæ, in such a manner that the whole mass of ointment is thoroughly rubbed away—consumed, as it were—and none remains on his fingers or in lumps on his body. If possible to employ a trained nurse to do the inunction, better results will, of course, be attained than when the patients do it themselves. If time permits, I order the patient to rub in the salve leisurely on one side first, and then on the other; in this manner he is sure to rub it in more thoroughly than when he rubs it on both sides simultaneously. In order to avoid irritating the skin, I cause the salve to be rubbed in each day on a different part of the body, as recommended above. The amount of unguentum hydrargyri necessary for each inunction varies with the size of the body and susceptibility of the individuality—from 2·00 to 5·00 (grs. xxx to lxxv) for an adult, and from 1·00 to 2·00 (grs. xvj to xxx) for a child.

A very good method I have found is to order the patient to rub in the required amount of the ointment just before going to bed, drink a pint of hot milk, get into bed, wrap himself up in blankets, and sweat. In the morning he should take a bath, or at least wash the part where the salve was rubbed in with warm water and soap. The hot milk is both nutritious and sudorific, and is an invaluable adjuvant in helping the system to get rid of the syphilitic virus. One great advantage of this method is that no patient is so poor that he can not provide himself with the agents necessary to carry it out. The rubbing in of the salve before going to bed does not interfere with his vocation, and his remaining in bed the whole night obviates the danger of his taking cold. For the sake of greater cleanliness, I sometimes use the oleate of mercury, but the objection to unguentum hydrargyri on the score of uncleanliness is obviated if the patient uses the same night-shirt while undergoing the course of inunction.

2. The body must be maintained in a good state of health during the treatment.

Above all things, it is necessary that the patient should breathe plenty of good air. The lungs must work in *a good*

atmosphere, while the skin is impressed into service and compelled to absorb the antidote against the syphilitic poison. The patients should be out in the open air as much as possible, and sleep in as large a room as they can obtain. In small rooms more or less of the vapor of mercury accumulates in the air, and a tainted atmosphere is thus inhaled. For this reason, also, no one should share the room with the patient. The physician should insist upon the patients' taking sufficient out-of-door exercise, and properly ventilating the room they sleep in; the fear of taking cold is so great that they often go to the opposite extreme, shutting themselves up in small, poorly ventilated rooms, and thus do themselves great injury.

In regard to nutrition, it is only necessary to say that syphilis ushers in an acute anæmia, which saps and vitiates the system of the patient in proportion to the severity of the disease; the debility is proportional to the loss of bodily weight. Hence the necessity of placing the patient upon the best possible diet. The brilliant results which the inunction-cure and low diet achieved in former years can not be set up against this proposition A sufficient amount of good and nutritious food should be allowed; I am even in favor of according the privilege of partaking of a moderate amount of good wine or malt liquor daily, for the purpose of stimulating digestion and assimilation, and thus expediting the metamorphosis of the tissues by a better and richer blood-supply. However, owing to the gluttonous habits of some individuals, it will be well for the physician to prescribe for the patient the amount of food and drink necessary for him. It is of the utmost importance that he should not overtask his digestive organs, for upon the ability of the latter to prepare a proper pabulum will depend the recuperation of the entire system.

It is highly essential that the mucous membrane of the mouth be maintained in a good, healthy state, and the tendency to mercurial stomatitis be obviated by appropriate local treatment. There is great diversity among patients in this respect. Some are very prone to suffer from mercurial stomatitis, and others remain exempt from it throughout the whole course of the disease. But whenever the tendency manifests

itself it should be counteracted by the use of some of the remedies mentioned above. If ulcers form in the mouth, they should be cauterized with nitrate of silver or chromic acid—the latter solution being employed one hundred grains to a drachm. In addition to this treatment, the patient must be enjoined to keep his mouth perfectly clean, and renounce the use of tobacco absolutely.

I wish to say here that it is possible to habituate patients to the use of mercury, however sensitive they may be to it, and, if such a person comes under treatment, it is best to begin with a small quantity of mercurial salve and gradually increase it. If perchance salivation has been produced, the inunction should be suspended altogether till all the symptoms of mercurialization have disappeared.

Sometimes it is difficult to distinguish mercurial from syphilitic ulcerations. Both occur on various parts of the mucous membrane of the mouth and resemble each other very closely. This is especially true of mercurial ulcers that occur on the tonsils and palate. Here the matter can only be decided by time, watching the case carefully, and, if necessary, suspending the inunctions for a while. If the ulcers are mercurial in origin, they will get well by the use of the above-described lotions for the mouth, but if syphilitic they will constantly become aggravated. They also act quite differently in reference to cauterizations. A syphilitic ulcer will get well—a mercurial ulcer becomes aggravated by cauterization. An increased flow of saliva may also cause uncertainty in regard to its origin, for sometimes cases are met with in which this condition is simply due to irritation of the nerves of the mucous membrane of the mouth and of the salivary glands by the syphilitic virus. This point, however, can be decided by the history of the case and whether the patient has been subjected to a treatment with mercury or not.

Another objection has been urged against the inunction method, namely, the production of sleeplessness. But, on investigation, I have found that it is not of sufficient consequence to cause a suspension of the treatment. It occurs very seldom, and its effects are transient. I am, moreover, of the opinion that it is due to the general nervous irritation

of the system caused by the syphilitic virus, as is manifest by the loss of sensibility of the cutis, and by the dilated pupils, and is therefore a still greater indication for persevering with the treatment.

A word or two in reference to the local treatment of syphilitic lesions during the inunction-cure. Although the latter will almost always prove sufficient to cause ulcerations of the skin and other parts to heal, still a proper local treatment will be found of the utmost advantage. Above all, the sores are to be kept scrupulously clean, in whatever stage of the disease and upon whatever part of the body they may be. Solutions of bichloride of mercury, of carbolic acid, nitrate of silver, iodoform, boracic-acid ointment, etc.—any one of these will render efficient service. For the nose, vagina, or rectum, Esmarch's irrigator will be found indispensable.

3. The inunctions must be continued long enough.

To cause the morbid lesions to heal, and prevent relapses—that is our task. The earlier the syphilitic patient is taken in hand, and subjected to a thorough anti-specific treatment, the milder the disease will run its course, and the more rapidly will the symptoms disappear. I have seen so many hard, initial sclerotic nodes, or hard chancres, attended by indurated plaques of inguinal glands, disappear, melt away as if by magic under the inunction-treatment, the patients remaining subsequently free from relapses, that I no longer hesitate to put a patient under the specific inunction-treatment as soon as I have satisfied myself of the true nature of the lesion. It is conceded by some of the best authorities that it is easier to cure a patient radically of his syphilis while the infecting virus is still localized in the initial sclerosis, or even if it has affected the inguinal lymphatic glands, than when it has permeated his entire system, less medicine and a shorter time being necessary to counteract a poison confined to a limited space than when diffused throughout the tissues and fluids of the body. I prefer the inunction method for this purpose, because I can accomplish more with it in a given time than by the internal administration of mercury. Besides, it possesses the additional advantage over the latter of not interfering with the patient's digestion. The complications of the inunction-cure spoken of

above are only seen in exceptional cases, and have been referred to at length because of the greater value it possesses over other methods of treatment. I quite agree with Von Sigmund in his statement that there will scarcely ever be seen a case of syphilis which the inunction method, if continued long enough, will not cure effectually. It is well to state here that, to cure a patient radically, and render him proof against relapses, it is necessary to prolong the inunctions of mercury for from eight to ten days after the symptoms of syphilis have entirely disappeared.

One of the most useful adjuvants in the treatment of syphilis is the hot-air bath, Russian or Turkish. The use of topical bathing before and after the rubbing in of the mercury has already been alluded to. The hot-vapor bath for the purpose of causing profuse diaphoresis is an invaluable remedy. I cause my patients to take one and often two a week. It is well to caution them against remaining too long a time in the hot-air chambers, fifteen or twenty minutes being sufficient to cause active turgescence of the skin, attended by a profuse flow of perspiration. A longer stay will relax the system too much and prove debilitating. The physiological action of these baths is that of a derivative of the greatest power, and their good effects are soon manifest.

A word or two more in reference to the use of the iodides. Everything that has been said concerning the susceptibility of certain individuals to the use of mercury is applicable with still greater force to the preparations of iodine. Often they are tolerated badly, or not at all, even when taken after meals and largely diluted. Thus, in one patient, it was impossible to administer the remedy unless it was preceded by a teaspoonful of brandy largely diluted with water. The individual was not of intemperate habits. In other patients, again, the dose required to produce a physiological impression upon the system, to bring about a state of iodism, may vary in amount from 0·60 to 4·00 (grs. x to ʒ j) every three or four hours. Many physicians prescribe small doses of the iodide in combination with mercury, even for the early manifestations of the disease, in what is denominated the "mixed treatment," each dose containing about 0·01 (gr. $\frac{1}{10}$) of corrosive sublimate,

and 0·30 (grs. v) of iodide of potassium, properly diluted. When an important organ is involved and is in danger of being irreparably damaged, full doses of the drug—from 1·00 to 4·00 (grs. xv to ʒ j) three or four times a day—will render efficient service; likewise, when the use of the mercury has to be suspended and it is necessary to prolong its specific effect. On account of its rapid action, it is especially useful in those terrible night-pains that sometimes threaten to drive a patient to distraction. Finally, the remedy is often serviceable in detecting the true nature of an obscure syphilitic lesion. The many cases of nervous affection whose etiology is so difficult to elucidate, and in which cures are reported to have been achieved, are doubtless of syphilitic origin. Patients are often met with who form their own diagnosis by the statement that iodide of potassium has repeatedly relieved them of their distressing ailment, thus affording the physician an indication of the true nature of their disease. Thus, one patient informed me that he had been suffering for five years from the most violent pains in his stomach and frequent emesis, which was always controlled by iodide of potassium; and, on inquiry, I found that he had had a chancre some eight years before, followed by a slight syphilitic eruption, but supposed himself to be entirely cured of his disease.

It may be remarked *en passant* that the remedy is often abused. Many of the morbid lesions of this disease get well under its use, and thus the patient becomes accustomed to resort to it whenever anything happens to him. In the course of time he finds, greatly to his surprise, that the remedy makes no impression upon the disease, the symptoms remaining stationary, or even becoming aggravated, a condition of tolerance having taken place; not only has the iodide lost its power over the disease, but it may happen that, when the patient submits himself to radical treatment, such as may become necessary upon the supervention of some acute specific lesion, he is extremely unimpressionable to the action of the remedies. A longer or shorter interval of abstinence from all medication will then be necessary before the remedies can exert their power over the disease.]

(*b*) *Hypodermic Mercurial Treatment of Syphilis.*

Lewin was the first physician who systematically practiced hypodermic injections of corrosive sublimate in the treatment of syphilis, though many had employed various preparations of mercury subcutaneously before him.

Before we relate the results of our experience with hypodermic injections, we desire to say a word concerning the technique and the precautions that are necessary. A broad fold of skin should be pinched up and made as tense as possible, because the point of the hypodermic needle will then penetrate the skin much more easily, the pain will also be lessened, and a vacuum is thereby created over a comparatively large surface for the absorption of the injected fluid. These factors obviate, to a great extent, the danger of the formation of an abscess. The oiling of the needle before injecting the medicine is superfluous, but the entire instrument should be cleansed in water and dried before each operation, so that the canula does not become rough and clogged up, and particles of corrosive sublimate forced into the skin. The piston should work smoothly, failing in which, and if much force has to be used, there is danger that the opposite fold of skin will be punctured, and the injected fluid penetrate into, instead of under, the skin. In injections with corrosive sublimate, such an accident is liable to be attended by unpleasant results; the puncture becomes inflamed, suppurates, and causes severe pain. The skin should be punctured and the entire injection performed as quickly as possible. In corpulent persons the injections, it is true, are made with more difficulty; still, they can be performed if a fold of skin sufficiently broad is pinched up. We have never seen any bleeding from puncture of a blood-vessel.

In regard to the frequency of salivation, we must say that gingivitis and stomatitis did not occur oftener in the patients we treated by hypodermic injections than in those treated by inunctions with mercury. Relapses and successive outbreaks of syphilitic phenomena occur just as often in the injection-treatment as in that by inunctions. It is a curious fact that if gingivitis develop during the mercurial inunction method, the

pyramids of the incisor teeth of the lower jaw, as a rule, are the first to swell up, while in the treatment by hypodermic sublimate injections gingivitis of the upper incisors usually develops first. If the injections are made in the vicinity of the primary induration and indolent absorption buboes in the groin, the latter will be the first to disappear; ulcerating papules offer the greatest degree of resistance to the hypodermic injections. The maximum of a total dose of 0·2 [grs. iij], either of calomel or of bichloride, was needed only in the most obstinate cases.

In regard to the choice of the mercurial to be used, we prefer corrosive sublimate to calomel, although, as a rule, we have seen the syphilitic phenomena disappear sooner from the use of calomel injections. But this advantage which calomel possesses is greatly offset by the fact that the injections are almost always followed by boils, despite the utmost care adopted. Although they did not always suppurate, still they were very painful for a long time. According to the statement of the patients, the pains last longer after injections with a purely watery solution of sublimate than when the watery solution is mixed with glycerine. Gingivitis, as a rule, comes on later in injections with corrosive sublimate than with calomel.

We use the following formula:

℞ Sublimat. corrosivi, 1·00 [grs. xvj];
Glycerini puri, 70·00 [℥ ij, ℈ viij];
Aqua destil., 30·00 [℥ j].
M. S. For injections.

A syringeful of this solution contains 0·01 [gr. $\frac{1}{6}$]. The injections should be made into the back and sides of the thorax.

Some physicians—Legeois, for instance—fearing the corrosive effects of the sublimate, have injected a minimum dose, 0·005 [gr. $\frac{1}{12}$], combined with muriate of morphia. Dr. Staub, of Strasburg, employed for that purpose, a preparation of corrosive sublimate free from acid. He dissolved the sublimate and chlorate of ammonium in distilled water, and filtered the solution; next he dissolved the white of an egg in

distilled water and filtered it; lastly, he mixed both solutions, and filtered for the third time. Cullingworth found Staub's solution, aside from the trouble of preparing it, exceedingly liable to become decomposed, and injections made with it were followed by indurations that disappeared very slowly. No indurations, however, followed the use of solutions obtained by the method described by Von Bamberger, in 1876, and many patients treated alternately with Staub's and Bamberger's solutions maintained that the latter preparation is much less painful. In Bamberger's solution pepton is used in place of albumen, which simplifies its preparation, and renders it more permanent. He dissolved 1·00 [grs. xvj] of meat-pepton in 50 ccm. [℥ j, ʒ v] distilled water, and filtered the solution. To this he added 20 ccm. [ʒ v] of a five-per-cent sublimate solution, and dissolved the resulting precipitate with the requisite quantity (15 to 16 ccm. [ʒ iv]) of a solution of table-salt, poured the liquid into a graduated glass, and added distilled water till the whole amounted to 100 ccm. [℥ iij, ʒ ij]. Every cubic centimetre then contains exactly 0·01 [gr. $\frac{1}{6}$] mercury combined with pepton. The liquid should be covered and allowed to stand quietly for several days. A slight amount of white flaky precipitate settles, from which it is finally separated by filtering. This preparation keeps better than the albuminate, and injections made with it only cause so much pain as is experienced from the sudden tension of the subcutaneous connective tissue. Other physicians (Boulton, for instance) inject iodide of mercury in a solution of iodide of potassium. Still others have tried various other preparations of quicksilver for injections, especially hydrarg. acet., hydrarg. iodatum, and hydrarg. biniodatum rubrum, and, lastly, a watery solution of iodide of potassium containing the protoiodide.

But the last-mentioned injecting fluid is now almost entirely abandoned, as it is liable to be precipitated and act as an irritant. Lately, the chromate of the oxydul of mercury and the methyloxydhydrat have been tried; we have had no experience with these preparations. Cullingworth, Von Sigmund, and Gürtz recommend hydrarg. bicyanetum.

Quite recently a one-per-cent solution of *mercury formamid* was recommended for subcutaneous injection by Lieb-

reich. We have tried this preparation quite extensively. In its action it differs in no respect from other mercurial compounds; it causes the symptoms of syphilis to disappear just as quickly, and also produces salivation as readily as other preparations of mercury, and the relapses, too, occur just as often after its use as after any other.

The main advantage of the hypodermic mercurial treatment is that the dose of the medicine introduced into the system is not only very much smaller than that which is administered by the mouth or in the inunction method, but it can also be measured accurately. Furthermore, it is also a much cleaner and less expensive method than the inunction or internal treatment, circumstances which, in private or even hospital practice, can not be over-estimated. Nevertheless, we seldom resort to this method now, because it is by no means painless, is as little capable of preventing relapses, and just as often occasions mercurial stomatitis, as any of the other methods of administration.

(*c*) *Treatment of Syphilis by Mercurial Fumigations.*

For many years H. Zeissl and others treated their syphilitic patients in the Vienna General Hospital by mercurial fumigations, according to the method described by Dr. Henry Lee, of London. The patient, entirely nude, is placed upon a cane-bottom chair and wrapped in a cotton gown provided with a hood, the face only being exposed. A funnel-like vessel, open below and perforated with holes all around, is placed under the seat. At one place it is cut out for the admission of a spirit-lamp. Above, the vessel is shut off by a plate which is depressed in the middle, where a small saucer is placed. The depression in the plate is filled with water for the purpose of generating steam-vapor, and in the saucer 1·50 [grs. xxij] of calomel is placed. On lighting the lamp, vapor, impregnated with the fumes of calomel, is generated and deposited upon the skin of the patient. Most patients feel very comfortable during and after the fumigation, the respiration being in no way interfered with by the process. Directly after the fumigation they must go to bed, to avoid taking cold.

The fumigations may be made every day, or every other

day, or even at still greater intervals. The greatest number of fumigations necessary to perform a cure was fifty-five. Salivation occurred in ten cases. Relapses sometimes ensued after numerous fumigations. No syphilitic patients, who are liable to attacks of hæmoptysis, should be subjected to the fumigation-treatment with mercury. We never employ this method now.

(*d*) *Treatment of Syphilis with Baths containing Mercury.*

Corrosive sublimate is the only preparation used in treating syphilitic patients with baths containing mercury in solution, and by the addition of muriate of ammonia it is rendered more soluble. The following is the formula we use:

℞ Sublimat. corros., 15·00 [℥ ss.];
Mur. ammonia, 5·00 [ʒ iv];
Aqua destil., 100·00 [℥ iij, ʒ viij].
M. In vitro bene obturato.

This solution is poured into a bath at a temperature of 27° to 28° Réaumur [92° to 95° Fahr.]. The patient remains in it for about an hour and a half, during which time it is covered so that only his head is exposed. Corrosive-sublimate baths are adapted for individuals whose skin will not bear inunctions, whose respiratory organs do not tolerate inhalations, and whose digestive organs rebel against the internal administration of mercury. They are especially useful in patients suffering from pustular and ulcerating syphilis, and those in whom mercury when internally administered produces unpleasant digestive disturbances. But they should not be employed if the pustules are dry and exfoliate, and leave behind perceptibly hard perifollicular infiltrations — a phenomenon which we often had an opportunity of observing in variola syphilitica.

While the sublimate baths are being used the same dietary measures should be enforced as in any other method of mercurial treatment. These baths likewise are apt to occasion salivation. It is not possible to presage the exact number of baths that will be necessary in any given case.

As the absorbing power of the skin is undoubtedly differ-

ent in different persons, it is not possible to say how much sublimate of mercury—which, as is well known, is a very active remedy—is absorbed, and hence this method is not likely to be extensively used.

(*e*) *Treatment of Syphilis by the Application of Mercurial Suppositories to the Mucous Membrane of the Rectum.*

In many cases H. Zeissl has used suppositories of unguentum hydrargyri by way of experiment, in the following form:

℞ Ung. hydrarg., 1·50 to 3·00 [grs. xxiij to xlvij];
Ung. ceti., 5·00 [ʒ iv].
M. Ft. sup. No. IV.

The patient inserts one of the stronger suppositories in the evening into the rectum, and of the weaker suppositories one in the morning and one in the evening. By this method of applying the mercury we have often caused recent relapses of papular eruptions to disappear. In some cases evidences of beginning disease of the mucous membrane of the mouth—stomatitis were produced. The mucous membrane of the rectum was not directly affected by the suppositories.

Pathogenetic Effects which Mercury and its Preparations may produce during Treatment.

In some persons, the preparations of mercury, like the pure mineral, when introduced into the system, produce in a remarkably short time, in others after a longer period, certain morbid effects. Collectively, the phenomena produced by the toxic effect of quicksilver have been described by the name of mercurialism, hydrargyrosis, or quicksilver-disease. An acute and chronic hydrargyrosis is distinguished, and according as it is produced by the industrial use of mercury or by medicinal application it is known as industrial or medicinal hydrargyrosis. The latter manifests itself by a peculiar affection of the mucous membrane of the mouth, namely, stomatitis mercurialis. We have never seen any ulceration of the skin or disease of the bones, or paralysis, in consequence of the therapeutic use of mercury, even in cases in which its misuse was carried to the extreme.

Mercurial affection of the oral mucous membrane manifests itself usually by an unpleasant metallic taste in the mouth. The patient has the sensation as if the teeth are blunted and elongated, and of dryness in the mouth. An effort to chew solid food causes pain and slight bleeding of the gums. Gradually the patient finds that he wants to spit often. If at this time pressure is made upon the submaxillary gland, pain will be experienced, because the gland is somewhat enlarged. The gums, especially of the lower incisors (less of the upper), the lips, the mucous membrane of the cheeks, especially around the mouths of the mucous follicles, are of a bright-red color, swollen, and in places ecchymotic. The edges of the gums are livid, tumefied, surround the individual teeth like a wall, and separated from them; and for that reason they seem to the patient to be elongated and loose. In the spaces between the teeth the secretion of the glandulæ tartricæ accumulates, in the form of a sticky, yellowish-green, offensive substance. The secretion of saliva increases more and more, and becomes an actual *salivation*. Lastly, the tongue swells, and becomes covered with a dirty, slimy coating. The patient experiences difficulty in moving the organ, and it sometimes attains to such a size that the mouth is not large enough to contain it, so that the apex protrudes between the incisor teeth, and the lateral surfaces bear the indentation of the rest of the teeth (lingua crenata). The patient suffers from thirst, and the large quantity of saliva which he swallows sometimes causes nausea and vomiting. If the action of the mercury is not arrested, and if the patient in addition is subjected to such influences as will naturally occasion stomatitis and scorbutus, the entire mucous membrane of the mouth will become coated with a grayish, diphtheritic layer, which can not be brushed off without causing loss of substance. The mucous membrane finally also becomes infiltrated and sloughs form, particularly on those places that are pressed upon by the teeth. When the sloughs are cast off considerable bleeding takes place, and then irregular, excavated, painful ulcers covered with a grayish coating originate. The quantity of saliva secreted sometimes amounts to several kilogrammes [many pounds]. It is a remarkable fact that the saliva, according to some of the most eminent chemists

(Schneider), contains very little or no mercury; on the other hand, according to Kletzinsky, sulpho-hydrate of ammonia and traces of urea are found in it—the former apparently being the cause of the offensive odor. The teeth may ultimately become so loose that they fall out. In consequence of the mercurialization the soft parts of the lower jaw are sometimes destroyed by sloughing, periostitis ensues, followed by deposits of porous, pumice-stone-like substance, which are known by the name of osteophytes.

Carious teeth, or other morbid conditions of the mouth, neglect and uncleanliness of the teeth and gums, cold and wet, and foul air, promote the development of stomatitis. In some persons salivation ensues after they have undergone a mild course, in others after a severe course, of mercury. It hardly ever occurs in infants and old, toothless persons.

A slight mercurial affection of the mouth, and tenderness of the gums, is of no consequence. On the contrary, even the opponents of the salivation-cure do not object to it, because they deem it a favorable prognostic sign in regard to the cure of syphilis. But severe stomatitis, produced by prolonged and excessive use of mercury, may be followed by very sad results. By the sloughing of the lips, mucous membrane of the cheeks or tongue, irremediable loss of substance may ensue; the mucous membrane of the lips may become united to the jaws, the tongue, or floor of the mouth, so that, on the one hand, the opening of the mouth, on the other, the movements of the tongue, may be prevented (Bamberger).

In order to prevent the occurrence of mercurial stomatitis the patient should be informed at the commencement of the treatment of the prodromata of the disease, so that he may suspend its use as soon as they appear. Furthermore, the patients should be instructed to rinse their mouths several times every day during the time they are undergoing the mercurial treatment; they should be cautioned against exposing themselves to a too high or too low temperature, and the room they occupy should be carefully ventilated at least once a day. If the stomatitis is already fully developed, the patient should be removed, if possible, from the atmosphere that is impregnated with particles of quicksilver into a purer one. His

clothes, utensils, etc., to which mercurial ointment may adhere, should be removed, and he should be immersed in a warm bath.

The local treatment depends upon the intensity of the affection. If the mucous membrane of the mouth is only catarrhally red or loose, the patient should be instructed to rinse his mouth every half-hour with one of the following lotions:

℞ Tr. opii, 5·00 [ʒ iv];
Aqua fontan., 500·00 [℥ xv].
M. S. For gargle.

℞ Glycerini puri, 20·00 [℥ jss., ʒ iv];
Tannini puri, 5·00 [ʒ iv];
Aqua font., 500·00 [℥ xv].
M. S. For gargle.

Lotions for the mouth, consisting of solution of alum, borax, tincture of rhatany, salvia, tormentilla, etc., are equally efficacious. When the salivation is severe, use—

℞ Tr. iodinæ, 5·00 [ʒ iv];
Aq. fontan., 500·00 [℥ xv];
Aq. cinnamom.,
Syr. cinnamom., āā, 50·00 [℥ jss., ʒ iv].
M. S. Mouth-wash.

Lotions composed of chlorine abolish the offensive odor of the mouth very rapidly. The following may be ordered for this purpose:

℞ Chlorin. liquid., 10·00 [ʒ viij];
Decoct. althæ, 500·00 [℥ xv];
Mel. rosarum, 50·00 [℥ jss., ʒ iv].
M. S. Lotion.

℞ Kalichlor., 5·00 [ʒ iv];
Aq. font., 500·00 [℥ xv];
Syr. moror., 20·00 [℥ ss., ʒ iv].
M. S. Gargle.

If diphtheritic or gangrenous sloughing of the mucous membrane of the mouth has already taken place, either of the following may be ordered:

℞ Ext. ligni. campechiani., 20·00 [℥ jss., ℈ iv];
Aq. fontis.,
Aq. salviæ, āā, 200·00 [℥ vj, ʒ vss.].
M. S. A lotion for the mouth.

℞ Emuls. commun., 300·00 [℥ ixss., ℈ iv];
Camphora., 3·00 [grs. xlvij].
M. S. A lotion for mouth, and for painting the gangrenous sores.

If these remedies prove ineffectual, pyroligneous acid or chloride of calcium should be tried; mixed with an appropriate amount of water, they may be used as a wash for the mouth and application to the ulcers. The diphtheritic patches may also be touched with nitrate of silver, or painted with tincture of iodine. Narcotics, especially opium, may be used locally and internally for the relief of the pain. If the bowels are confined, some laxative should be administered, and water, acidulated with some vegetable acid, may be given as a drink. In cachectic persons who are greatly debilitated, care should be taken to invigorate them as much as possible.

Effects of Cold-Water Treatment, Sea-Baths, and Sulphur Thermal Baths on Syphilis and Hydrargyrosis.

In regard to hydropathic treatment as a curative remedy of syphilis, most authors are now agreed that it is an excellent adjuvant to other therapeutic measures. But the hydropathic treatment accomplishes no quicker results in syphilis than the expectant method. Cold-water treatment and *sea-baths* are especially useful in those patients who become greatly enfeebled by syphilis, or who suffer in consequence of the injudicious administration of mercury. Sulphur-baths generally have an excellent effect upon syphilitic patients. Under the use of sulphur thermal baths, the intense pains in the bones, especially, are greatly relieved. If the patients are sufficiently careful, some of the most obstinate syphilides, such as psoriasis palmaris, etc., will disappear more quickly with the use of the sulphur thermal, if appropriate anti-specific treatment is simultaneously carried out, than without the latter. Martineau recently asserted that sulphur-baths were a test of the persistence of latent syphilis. Still, should a relapse ensue

in a syphilitic patient who was under treatment with sulphur-baths, it is no proof that the baths occasioned it.

For a long time the use of sulphur internally and sulphur-baths were highly praised as remedies against hydrargyrosis, especially mercurial tremor. All we can say is, that we have obtained good results from sulphur-baths in persons who have not suffered long nor very severely from the tremor, and who, during the use of the baths, abstained from handling all kinds of mercurial preparations. It is possible that we would have obtained the same results from ordinary baths, but it is also probable that, by the use of the sulphur thermal, the tissues are stimulated to greater metamorphosis, and thus the quicksilver is more rapidly eliminated from the system.

Syphilophobia and Mercuriophobia or Hypochondria Mercurialis.

There are persons who, having suffered from syphilis or some other venereal disease, become a prey to feelings of despondency, which is best described by the term syphilophobia. They fear that they are still afflicted with syphilis, though not one symptom of it or any morbid alteration can be detected on their person. All rational attempts to convince them that they are free from the disease are useless. Day and night they busy themselves with their imaginary disease, and actually hunt for symptoms upon their persons, or conjure up some in support of their statement. "Thus they go about," says Ricord, correctly, "a burden to themselves and the whole world, ruin themselves by all sorts of cures which they practice upon themselves, or are induced so to do by ignorant or dishonest physicians."

On the other hand, there are also hypochondriac persons who, having heard of the injurious effects that may be produced by the improper use of mercury, imagine, when they ascertain that they took some of it, even the minutest quantity, that they will forever suffer the most dire effects. These persons think of nothing but their imaginary disease, neglect their affairs, and lose all interest in life. Any sensation they experience, any redness or swelling noticed by them; sometimes, indeed, perfectly normal elevations on the joints, bones,

etc., such as the cristæ tibiæ, which they accidentally discover, are attributed to the mercury, taken perhaps many years before. All the arguments that may be used to such psychical patients are in vain. The delusion that they are suffering from mercurial poisoning, and the hatred they entertain for the physician who gave them mercury, cling to them all the more if they have read mercurio-phobic writings, or are confirmed in their views by mercurio-phobic physicians. We have never yet found this psychopathy in persons belonging to the lower order of people, but only in those of the more affluent class.

Syphilization.

The treatment of syphilis by the method erroneously styled *syphilization*, has, since the death of Boeck, been entirely abandoned. Auzias Turenne first suggested it in 1844. He observed that, if a person is inoculated with the virus of a soft chancre for a long time, he will finally acquire an immunity against the poison, and the subsequent inoculations fail to take. Such persons are said to be syphilized. But, as we know that the soft chancre and the syphilitic primary lesion, or, as the French physicians call it, the infecting chancre, are two different morbid processes, like pneumonia and pleurisy, we must, like Haye, call this method simply "curative chancroid inoculation." But a healthy person who has been inoculated with the matter taken from a syphilitic primary lesion and has had syphilis, may be said to be proof against syphilitic infection a second time, because we know that reinfection with syphilitic virus is one of the rarest occurrences. A *prophylactic* and a *therapeutic* syphilization is distinguished. The former, it is claimed, acts in the same manner as vaccination. In regard to the effect of the soft chancre upon a person already affected with syphilis, Haye says that the inoculated chancroids are derivative foci, "exutoria," similar to those that may be produced by inoculations with croton-oil, tartar emetic, etc. These methods of treatment have been tried by Langenbeck, Hjort, and others. As we have already said, this kind of prophylaxis and treatment of syphilis is not employed any more, and is only historically interesting.

Treatment of some of the Local Syphilitic Affections.

Among the morbid alterations that may be occasioned by syphilis there are some which, partly owing to the disturbances of sensation, partly owing to the mutilation and disfigurement they produce, require local treatment in addition to the treatment of the general constitutional disease. These are affections of the organs of sight and hearing, the moist papules, mucous-membrane papules around the anus, on the genital organs, on the mucous lining of the mouth and fauces, syphilitic affections of the larynx and trachea, psoriasis palmaris and plantaris, deep ulcers of the skin and of the mucous membrane, solid and suppurating periosteal and osseous nodes, abscesses of the soft parts, caries and necrosis of a part of a bone, especially ozæna, perionychia, sarcocele syphilitica, strictures of the rectum, etc.

In regard to affections of the *organ of sight*, we refer the reader to the section on syphilitic affections of the eye, by Professor Mauthner.

Syphilitic affections of the *ear* require local treatment in accordance with the principles of otology. According to the statements of the most experienced otologists, the local treatment requires a long time before a cure can be accomplished, the general treatment being unable to achieve a satisfactory result.

In regard to the local treatment of syphilitic affections of the larynx and trachea, we refer the reader to the therapeutic recommendations of Professor von Schrötter, in the section on those diseases.

Mucous-membrane papules require different local treatment according to their site and metamorphosis. If they are situated in the mouth, and if, when they undergo degeneration, they assume only the form of erosions, simply washing them with a mild, astringent lotion, will often suffice to bring about cicatrization. But if they have become transformed into deep ulcers, it will be necessary to touch them once or twice daily with lunar caustic, or they should be penciled with a solution of iodo-glycerine like the following:

℞ Glycerine, 10·00 [℥ viij];
Kali hydroiod., 0·50 [grs. viij];
Iodine puri, 0·05 [grs. ¾]. M.

Vegetations growing upon proliferating papules of the mucous membrane of the mouth, if they do not shrink after the application of astringent or caustic remedies, must be removed with the scissors and the wounds cauterized.

Papules on the mucous membrane of the genital organs and rectum should be treated in the same manner, except that they may be cauterized much more vigorously.

Moist papules around the anus and genital organs require, above all, the utmost cleanliness, which can only be secured by frequently bathing or washing the parts. By inserting pledgets of lint between an affected and a sound part, the opposing surfaces are kept asunder, and the disease is prevented from spreading or infecting a normal part. Proliferating growths that frequently develop, and the fetid odor of the moist papules, should be destroyed as speedily as possible. For this purpose a modified Plenk's paste is used now, which is composed according to the following formula:

℞ Sublimat. corros.;
Camphoræ;
Aluminis;
Cerusæ alb.;
Spirit. vini;
Aceti vini, āā 5·00 [℈iv]. M.

These ingredients, being partly or entirely insoluble in spirit of wine and acetic acid, are precipitated and form a soft paste; the supernatant fluid is poured off, and the paste is applied with a small brush to the part which is to be cauterized. It causes little pain when first applied, but it soon becomes very severe; and for the purpose of relieving it, and of preventing the swelling of the parts, cold-water compresses should be applied. Care should be taken not to allow the paste to get upon any part of the skin covering loose cellular tissue, such as the labia majora and minora, the glans penis, cervix uteri, etc., as it is apt to occasion intense inflammation of the parts, which swell up excessively and may become gangrenous.

Labaraque's paste, modified by H. Zeissl, is very well adapted for cauterizing moist papules. Labaraque causes the papules to be moistened with a solution of table-salt, and afterward he strews calomel over them. H. Zeissl uses diluted

liquid chlorine instead of salt. The calomel, when it comes in contact with the chlorine, is probably converted into corrosive sublimate, and this sublimate *in statu nascenti* causes the warty growths to shrink almost painlessly, while a concentrated solution of corrosive sublimate that will serve the purpose of destroying the adventitious growths occasions the most violent pains.

Sublimate collodion is another caustic used for the purpose of removing papillary infiltration and proliferations, and is prepared in the following manner:

℞ Sublimat. corros., 1·50 [grs. xxij];
Collodii, 20·00 [℥ ss., ℈ iv].
M. S. For external use.

This preparation is carefully applied to the parts with a camel's-hair brush daily, or every other day, and afterward they are covered with wadding or charpie. If severe inflammation ensues, cold-water compresses should be applied. Owing to the intense pains which this caustic preparation occasions, we only use it in places where the epidermis is very thick.

We use local applications in addition to general remedies only in those forms of psoriasis palmaris et plantaris in which numerous deep fissures and epidermal welts develop in the palms of the hands and soles of the feet, accompanied by intense onychia. In mild cases we simply prescribe an ointment of fat and spermaceti, or unguentum diachylon in oleo-coctum, or paint the palms and soles with a lotion containing tar, and then dust the parts with powder, or apply emplastrum hydrargyri to the diseased places; or, lastly, we use white precipitate ointment, 4·00 [ʒ j] to 35·00 [℥ j, ℈ iv] of cerate, of which the patient may rub a piece as big as a hazel-nut upon the palm of the hand and sole of the foot. Painting the affected parts with sublimate collodion or tincture of iodine also promotes desquamation and absorption.

Ulcers originating as a result of paronychia should be covered with adhesive plaster, mercurial plaster, or traumaticin.

Deep *ulcers of the skin* should be cleansed as often as possible, and then covered with emplastrum de Vigo or sapona-

tum. If cicatrization does not ensue, the ulcers should be covered with pledgets of lint smeared with the following ointment:

℞ Argent. nitratis cryst., 0·10 [gr. 1½];
Ung. simpl., 10·00 [ʒ ij, ℈ ij];
Bals. Peruv., 1·00 [grs. xvj].
M. Ft. ung.

Iodoform, too, has rendered excellent service in torpid and proliferating ulcers.

If *suppurating gummata* are situated upon the soft palate, and if the latter is in danger of perforation, the margins of the ulcer should be touched with lunar caustic every day. If general treatment is simultaneously instituted, small perforations of the palate will often become smaller, so that it is barely possible to put a fine probe through them—a matter that is of great importance in phonation. The perforations of the mucous membrane on the hard palate may likewise be reduced in size by the use of nitrate of silver.

The local treatment of ozæna syphilitica has for its object the speedy exfoliation of the necrotic piece of nasal bone. This is best promoted by injecting dilute solutions of muriatic acid or chloride of calcium into the nasal cavities. In these cases we prescribe:

℞ Acidi mur. dil., 5·00 [℈ iv];
Aqua destil., 300·00 [ʒ ixss., ℈ iv];
Aqua salviæ, 100·00 [ʒ iij, ℈ viij].
M. S. For external use.

℞ Chlor. calcis, 5·00 [℈ iv];
Aqua destil., 300·00 [ʒ ixss., ℈ iv];
Aqua rosarum, 15·00 [ʒ ss.].
M. To be put in a black bottle for external use.

The nasal cavities should be injected with either of these solutions four or five times every day by means of a syringe provided with a long nozzle; or, if a fountain-syringe is used, the tube is inserted into the nose, the patient being directed to hold his head backward for a few moments, when some of the fluid will flow into the nasal passages.

Ozæna syphilitica frequently is the residuum of syphilis

that has already reached its end, the prolonged ulceration of the nasal bones and nasal mucous membrane, and the ichorous discharge, being kept up by the irritation which the necrosis of the bone exercises upon the surrounding structures. General treatment is only indicated in ozæna when new syphilitic outbreaks occur on different parts of the body, or if those that already exist do not disappear. In these cases reliable proof of the specific character of the lesion will be necessary before treatment with mercury or iodine is resorted to. In most ozæna patients scrofula will be found to play a great part, and they will require cod-liver oil and tonics more than anti-specific remedies.

In syphilitic *sarcocele* Fricke's compression-bandage may be employed in addition to internal general treatment, or the affected half of the scrotum may be covered with mercurial plaster. The coexisting hydrocele disappears spontaneously when the swelling of the testis has subsided; if not, the dropsical tumor may be tapped, and a dilute solution of iodine injected, or the operation for the radical cure may be performed.

In pains of the bones and joints, which sometimes do not yield to either mercurial or iodine treatment, nor are assuaged by narcotics, we found in many cases the local treatment recommended by Ricord to be of great benefit. He recommends a blister to be applied upon the painful part, and after the skin has been removed the place is either covered with cerate-plaster, or morphine is strewed upon the raw surface.

In periosteal thickenings an attempt should be made to bring about resolution by painting the part with tincture of iodine or moderately concentrated iodo-glycerine. Even if fluctuation is detected, the swelling should not be hastily opened, for absorption may sometimes take place. Should the pain, however, become aggravated, and the tumor larger, it should be opened by a valvular incision, in order to prevent the entrance of air into the cavity of the abscess. In very intense, painful periosteal swellings, Ricord and other physicians recommend deep crucial incisions and scarifications of the bone.

Ulcers of the *rectum* should be washed several times a day,

especially after each stool, and a tolerably strong solution of iodo-glycerine applied four or five times a day, or they may be cauterized with nitrate of silver. In case stricture of the rectum is apprehended, in consequence of contracting cicatrices, compressed sponge-tents or cones of laminaria digitata should be inserted early into the gut. If stricture has already formed, an attempt should be made to dilate the rectum by the aid of bougies; unfortunately, the results of this treatment usually are only temporary. There is no other therapeutic resource in such cases than to promote evacuations from the bowels by the administration of oleaginous clysters and purgative remedies.

The Nursing of the Syphilitic Child and the Treatment of Congenital Syphilis.

So long as no evidences of syphilis are observed on a child begotten by syphilitic parents, it should not be subjected to antisyphilitic treatment, though it requires careful attention. The question arises, How should a child be nursed that is born with manifest evidences of syphilis, or that is suspected of being afflicted with hereditary syphilis? Should it be suckled by its mother, or by a wet-nurse? That the milk of a healthy wet-nurse is the best nutriment for such an unfortunate creature admits of no question. If the mother was affected with constitutional syphilis during pregnancy, and yet gave birth to a child free from all evidences of general syphilis, as is often the case, such a child, if possible, should be suckled by a healthy wet-nurse. Even admitting that the mother's milk does not serve as a vehicle for conveying the syphilitic virus, and although no morbid alteration can be discovered in it chemically or microscopically, still it can not be deemed healthy nutriment, coming as it does from a diseased, feeble constitution.

But, if the mother and child are manifestly affected with syphilis, it will be absolutely necessary to procure a healthy wet-nurse for the child, because the debilitated mother will become still more enfeebled by nursing, and the infant will not thrive upon the unhealthy milk. But such a child should only be given to another woman after she has been fully in-

formed of the risk she runs of being infected. To hide the true nature of the child's illness, to persuade a healthy woman to undertake the nursing of a syphilitic child, would be an unpardonable act, because the health of the woman is thereby endangered, while the saving of the child is doubtful; indeed, in our opinion, highly improbable. However, if after the woman was fully informed she is disposed to undertake the duties of a wet-nurse, she should be instructed to keep herself and child scrupulously clean. On discovering any fissure on a nipple, she should not put the child to the affected breast, but nurse it on the sound breast only. She should not allow the child, as is customary with wet-nurses, to lie at her breast by the hour, for then the nipples, being in contact with the lips of the diseased child, are sure to become injured. Both the nipple and breast should be washed clean every time the baby has been suckled. A sure protection for the wet-nurse is the use of a nipple-shield during the suckling of the infant.

If the mother displays no evidences of constitutional syphilis, it will be far more judicious for her to wet-nurse her own child. So far, only three instances are known in which syphilitic children infected their own mothers. The circumstance that mothers are never, or hardly ever, infected during wet-nursing by their hereditary syphilitic offspring, is now known by the name of Colles's law.

Still, since it may happen that a perfectly healthy mother may become infected by her own syphilitic infant, it will be well, as Behrend suggests, to allow her to wet-nurse her child only so long as no evidences of syphilitic manifestations are observed on the mouth and fauces of the nursling. As soon as any specific symptoms appear on the infant, and the mother remains apparently well, she should be advised to discontinue wet-nursing it, and bring it up on artificial food.

If no wet-nurse can be procured to suckle such a child, and if the mother is not very much reduced by the syphilitic diathesis, she, being put simultaneously with the infant upon an antisyphilitic treatment, may be allowed to put it to her breast. But if the mother already shows evidences of the syphilitic dyscrasia, it will be preferable to bring up the child artificially

upon good, fresh cow's milk, or the milk of a wet-nurse, obtained by a nursing-tube.

In the treatment of syphilitic infants and nurslings, the care, cleanliness, and attention they will require deserve special consideration. The mouth of the nursling, especially, should be cleansed every time it is nursed, and, after each stool, the excoriated places at and around the anus should be washed clean and wiped dry. The medical treatment is both local and general.

The *local* treatment consists in the application of slightly caustic remedies, such as the nitrate-of-silver stick to the ulcerating places on the lips and anus, for the purpose of hastening their cicatrization, of assuaging the pain during suckling and during evacuations from the bowels, and, above all, by the production of an escharotic slough to protect the ulcers on the mucous membrane against irritation and uncleanliness.

For the purpose of promoting absorption of the mucous-membrane papules situated on the lips, angles of the mouth, on the anus and genital organs, and the moist papules on contiguous parts, Labaraque's paste, or a weak solution of iodo-glycerine, may be used.

In regard to the *general* treatment, it has been suggested that, in view of the tender constitution of the nursling, to administer mercurial remedies indirectly, namely, through the milk of the wet-nurse, who is treated with antisyphilitic medicine, or mercury is administered to goats or asses, and the syphilitic child is then fed with the milk from these animals. But numerous examinations of the milk of wet-nurses treated with mercury, and that of animals in whose fodder mercury was put, have shown that but very small quantities of the drug are found in it, and only after it had been administered to them for many days.

In view of the fact that the dose of the medicine given to a child in this manner can not be properly controlled, as also the fact, often observed, that nurslings in many respects tolerate mercury better than adults, we prefer the direct to the indirect methods.

If no diarrhœa or other complications contraindicate it, calomel should be used, this preparation being best tolerated

by infants, or the protoiodide of mercury may be prescribed, according to the following formula:

℞ Calomel. lævigati., or protoiod. hydrarg., 0·15 [grs. ijss.];
Sacch. alba., 5·00 [ʒiv].
M. Div. in dos. æquales No. xij.
M. S. One powder to be given morning and evening.

If profuse evacuations of the bowels, with or without colic-pains, ensue, *one* drop of the tincture of opium should be given during the intervals. If the diarrhœa does not diminish from the use of this remedy, the above-named preparations should be discontinued, and, after the diarrhœa has been checked, corrosive sublimate should be resorted to, as follows:

℞ Sublim. corros., 0·005 [gr. $\frac{1}{12}$];
Aq. font., 50·00 [℥ jss., ʒiv].
M. S. To be taken in one day.

As is well known, adults not infrequently complain of gastralgia from the use of corrosive sublimate, but infants are troubled with vomiting. If that be the case, small inunctions should be ordered on some parts of the body, provided the skin is not profusely covered with pustules, or the body is not extensively denuded of epidermis, or the infant is not too feeble. From 0·3 to 0·5 [grs. v to viij] of blue-mass may be used daily. The inunctions should be omitted every third day, and the infant placed in a tepid or warm bath. If, on account of numerous pustules (pemphigus syphiliticus) and excoriated places on the body, it is not possible to use the inunctions of mercury, the child should be put once or twice daily into a bath, containing corrosive sublimate, and prepared as follows:

℞ Sublim. corros., 2·00 to 5·00 [grs. xxxij to lxxx];
Mur. ammon., 2·00 [grs. xxxij];
Aq. font., 100·00 [℥ iij, ʒviij].
M. To be added to the bath.

The child should be kept about half an hour in this bath, and afterward carefully dried with warm towels. The internal use of mercury and inunctions act much more rapidly than corrosive-sublimate baths.

The preparations of iodine do not seem to agree well with infants; they appear to promote marasmus in sickly children.

The disappearance of the external manifestations of syphilis, however, does not by any means prove that the child has been cured of the disease. But the administration of mercury may be suspended for a time, the child meanwhile taking the lactate of iron, 0·15 [grs. ijss.] twice a day. Several days afterward, the mercury may again be administered in smaller doses than before. Unfortunately, however, our skillfully devised cures and plans frequently miscarry, for, contrary to all our wishes and efforts, the little patients often succumb to the disease.

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