when the danger seems extreme. The organ is found enlarged in most cases, the cortical portion is increased in relative size, and the tubules are blocked with epithelial débris and colloid masses. The glomeruli examined with the microscope may exhibit the same catarrhal state or be normal in appearance.

In the late lesions of the kidney there is found, as in the liver, a species of fibrosis ("interstitial inflammation") with resulting contracture and pressure-effects upon the glomeruli, or gummatous deposits, circumscribed or diffuse, the latter rather more rarely. As a consequence of either process amyloid or fatty degeneration may occur, in rare cases, simultaneously in the same organ. The lardaceous kidney of syphilis is large and white and unilateral or bilateral. At times good recovery ensues where but one organ was probably involved. The same is true of gummatous changes. In both conditions the urine may contain albumin, blood, casts, epithelium, and even pus-cells. Usually the cortical and pyramidal portions of the kidney are involved. There is strong reason to believe that gummatous changes in the kidney in syphilis are of greater frequency than is suspected, many patients recovering from even severe renal symptoms without grave results. It is to be remembered also that many of the renal changes minutely described in the treatises on pathology are supposed by modern authors to be indirectly due to syphilis. The prognosis is grave when both organs are involved and amyloid degeneration has taken place; syphilitic changes in one kidney or in a portion only of one are to be regarded with greater hopefulness. We have watched for fifteen years, after grave syphilitic involvement of the kidney, patients who suffered from no

return of renal symptoms. Surgical removal of a single kidney found to be affected with syphilitic changes has been followed by recovery.

Syphilis of the Nervous System.

Syphilis both early and late in its career affects the nervous system, the earlier manifestations being, for the most part, reactive, without appreciable lesion, and due chiefly to the circulation in the system of intoxicated blood. Late lesions of the nervous system may occur from a few months to several years after infection, and may result from syphilis of the osseous system, producing indirectly pressure or other injurious effects upon the nerves or the nervous centres in anatomical relation with the bones; or from syphilis of the meningeal coverings of the nerves, with effects not widely different from those exhibited when the bones are involved; or from syphilis of the nervous cells and fibres, or from syphilis of the larger vessels furnishing nutrient material to the nerves. Gummatous deposits may be responsible for the symptoms present in any of the several complications named, the evolution and subsequent history of the neoplasm having already been described. In one or another of these several forms syphilis of the nervous system occurs more often in male than in female patients, for the reason commonly accepted—that men are, as a rule, more than women subject to mental care and physical fatigue in business and toil. By some authors the nervous system is credited with the larger number of all the so-called "late" or "gummatous" changes noted in syphilis—a proportion, however, that is chiefly conspicuous in the statistics of experts in nervous maladies. Certain it is

that women as well as men suffer severely from the nervous complications of the malady; and, inherited disease excepted, it is probably true that a fatal issue in syphilis can more often be ascribed to the nervous system than to any other. The importance of the recognition of nervous syphilis and the pressing need of its appropriate therapy can scarcely be exaggerated.

Syphilis of the Brain and of the Cranial Meninges.—In brain-syphilis the effective lesion may be related to any one of the conditions noted above. The commonest localization is in the cortical portion of the brain, a gummatous deposit, either circumscribed or diffuse, directly or indirectly implicating the meninges. Meningo-encephalitis involving extensively one or both hemispheres, or a portion only of the nervous structure at one or several points, may result in varying grades of resulting damage. When an endarteritis obliterans (or, more rarely, a mesarteritis or a periarteritis) occurs, the injury is by thrombosis and subsequent occlusion, or by the formation of small aneurysms as in syphilis of the blood-vessels, or by dislodgement of one or more fragments of an embolus and their later transference in the blood-current to points at a distance from a forming neoplasm. For the localization of the nervous lesion by the aid of the symptoms in any case presented, the student is referred to the results of the admirable studies of this theme presented in the works on general pathology. Collectively, the symptoms may be described as, first and most common, headache, usually characteristically severe, of a boring, hammering, constricting, or grinding character, generally with very distinct nocturnal exacerbation, accompanied or not by vomiting, and at times terminating in relief in the most capricious manner. This pain may be aggravated by percussion or pressure over certain points of the cranium, and often is marked along the lines traced by the distribution of the trigeminus. A striking feature of all these disorders is the multiformity of the symptoms present and their capriciousness as to grave or insignificant results. Thus, symptoms of coma or of paralysis may appear or disappear in a way utterly impossible without grave sequence in any non-syphilitic disease. The multiformity so characteristic of the surface symptoms of the disease is often striking when the nervous system is attacked. Mental hebetude, stupor, coma of insidious beginning, convulsions, or a seizure simulating that of epilepsy, but different from it in that the average patient does not wholly lose consciousness, may each be significant. Of equal importance may be named hemianopsia, motor or sensory aphasia, disturbances of olfaction or of taste, persistent dilatation of one pupil, or paralysis of a single muscle or of a capriciously selected group of muscles within the orbit.

When syphilis affects the larger ganglia, the gummatous deposit is less likely to be implanted in the nervous tissue proper than in the walls of the larger vessels, especially those of the middle cerebral artery, the complete or even partial occlusion of which by an obliterating arteritis is apt to be followed by a monoplegic or hemiplegic attack, the consequences of which may be serious. Here the onset of the disease may be insidious and unaccompanied by the chain of symptoms of brain-syphilis; or all these may be present, with severe headache, mental hebetude, and even coma. As a rule, however, the patient suffering from a syphilitic hemiplegia is entirely conscious, and, though for weeks

previous the victim of an agonizing cephalalgia, is relieved of most of the cranial distress when motor paralysis is established. The reflexes of the wrist, of the elbow, of the knee, and of the ankle are usually exaggerated in the paralyzed extremities both after and before the seizure. It will be remembered that in consequence of decussation of fibres, the gummatous changes of one side of the brain are for the most part responsible for paralytic phenomena of the other. Recovery may be relatively rapid in the course of a few weeks, or it may require years for its completion. In some cases the damage done is irreparable, and contractures result in both upper and lower extremities; the speech becomes mumbling, and the patient, while life is yet conserved, reaches in almost every function of the body one of the lower levels of physical degradation.

Lesions of the crus are apt to be betrayed in oculo-motor paralyses associated with hemiplegia of the other side of the body, while those of the pons are liable to be followed by facial paralysis in which the arm and the leg of the opposite side are involved. In the case of affection of the medulla there is often a similar association of paralyses—a hemiplegia of one side and an involvement on the other of the vagus, glosso-pharyngeal, hypoglossal, or other nerves whose nuclei have a medullar site. There may be also a bilateral palsy of the four extremities, the result depending upon the extent of gummatous change in the meninges.

Paralyses of the oculo-motorius are so frequent in syphilis that their occurrence always leads to special inquiries on the part of the careful diagnostician respecting a possible syphilitic origin. The third, sixth, and fourth nerves (most commonly the two first named) may, when

affected, produce ptosis, paralysis of the superior oblique, external and internal recti, and failure of accommodation to light. The capriciousness with which one or more of the muscles innervated by these trunks are selected for attack is highly characteristic of syphilis.

Syphilis of the Cord and of the Meninges.—The symptoms of syphilis of the cord and its coverings are spastic paralysis of both lower extremities, involuntary action of the rectum and the bladder, exaggeration of some or all of the tendon reflexes, contractures of muscles, particularly of the adductors of the thighs, more or less anæsthesia, a tendency to the formation of bed-sores, and, in cases, pains of a severe character in the loins and the lower limbs. These changes may result from gummatous deposits in the vertebræ or in the meninges of the cord, or from a distinct specific myelitis or meningo-myelitis occurring in the cervical, dorsal, or lumbar region, one or all. Other symptoms which may be present in exceptional cases are changes in the ocular system (for example, persistent dilatation of one pupil), in the genital system (increased or diminished sexual desire and vigor), and paralysis limited to wrist-drop of both upper extremities, to cephalalgia, to aphasia, etc.

The etiological relation of syphilis to tabes has been the fertile source of a controversy which has at last been settled by an overwhelming preponderance of testimony, derived, for the most part, from evidence furnished not so much by syphilologists as by the statistics of insane asylums. Syphilis is without question a precedent fact in more than 90 per cent. of all cases of tabes. Patients of this class are, however, in the category of those little benefited by treatment for specific disease. Here, as in other ailments following infection, it seems that the

result is less directly due to the toxic agents of the malady than to some chain of factors set in operation by the syphilitic germ.

The symptoms of tabes dorsalis in syphilis and in a presumably small minority where syphilis has at least not been proven are the same, and for a description of these symptoms the reader is referred to treatises on general medicine. Care should always be taken, in establishing a diagnosis, to avoid setting down as symptoms of syphilis those due to other changes in the cord; as, for example, when there is a loss of one or more bones of the digits of the feet, or when from the same cause the nails are exfoliated.

Cerebro-spinal syphilis (multiple cerebro-spinal syphilis) is a term employed to indicate those cases in which there is simultaneous involvement of both brain and cord. The number of these cases is larger than is commonly believed.

Dementia Paralytica and other Mental States due to Syphilis.—It is exceedingly difficult to ascribe to the proper cause the many singular and diverse mental states recognized in syphilitic subjects. It is to be remembered that of a thousand victims of infection a certain proportion were before the accident predisposed strongly, from other influences (heredity, accident, etc.), to nervous disease, and that many others, during the long course of treatment required for the relief of syphilis, are exposed to numerous influences tending to induce mental states of a morbid character (business reverses, affliction, accidents). It is not very rare to find grave states of hypochondria leading to self-destruction in a certain class of young subjects of both sexes after infection; and transient dementia is occasionally encountered, with and without hallucinations and stupor. In these cases, as Sachs has shown, very remarkable intermissions and recovery stamp the disorder as due only to lues. The persistent dementias which prove complete are, fortunately, rare in syphilis. They usually follow the graver lesions of the nervous centres.

Dementia paralytica of the alienists (*délire des grandeurs*, general paresis), with epileptiform and apoplectic seizures, mental hebetude leading to failure of almost all the mental faculties, pupillary inequalities, tremor in articulating (lips and tongue), with singular changes in the moral qualities of the individual, is, like tabes dorsalis, amply delineated in the descriptions to be found in the best works on nervous diseases. To-day there is no question in the minds of the experts of large experience, chiefly those engaged in institutions for the insane, that syphilis is a precedent fact in a great majority of all cases. As in the instance of tabes, the infective process seems to be rather an indirect than a direct cause of the issue. The frequent relation of tabes with dementia paralytica would alone suggest the syphilitic origin of the last-named disorder, even if statistics were not at hand to confirm the fact.

Syphilis of the Peripheral Nerves.—The cephalalgias of nervous syphilis are, without question, at times represented by neuralgias due to specific involvement of the peripheral nerves. "Syphilitic sciatica" is as distinctly a symptom of a condition recognized in the subject of lues as is nocturnal cephalalgia; and cases are recorded in which gummata of bone and of other tissues in the tract of a nerve-trunk have by compression or other accidents induced serious changes in the nerves themselves.