

lar, trembling, jerking character, and at length becomes impossible. The resemblance to locomotor ataxia is all the stronger, since there may be ocular troubles, double vision, amblyopia, and even amaurosis, altered sensations, anæsthetic tracts, etc., about the body, and retention or incontinence of urine and fæces. These locomotor ataxia symptoms, we may assume with propriety, result from the sclerotic nodules deposited in the posterior columns, but a granular myelitis attacks the lateral columns in a smaller proportion of cases, when there will occur the peculiar shuffling and helpless gait and the anæsthesia belonging to this lesion. A paretic, ultimately paralytic state of the facial nerve occurs in many cases, and the muscular system generally is thus affected. Hemiplegia, usually transient as regards the motor functions, is often the result of an apoplectic seizure which may inaugurate the symptoms, or occur at any period during the course of the disease. Instead of motor hemiplegia, sensory hemiplegia may result from a sudden attack with loss of consciousness. Although such motor and sensory symptoms disappear very quickly, the mental condition is always much injured by these attacks. During the course of the disease, epileptiform seizures also occur; they may be unilateral or general, severe or mild. Epilepsia mitior, *petit mal*, with loss of consciousness, but no convulsive phenomena, may be substituted for the severe attacks or occur with them. Death may happen in the coma which follows an attack, or a decided remission in the symptoms, with apparent improvement in the mental state, may occur.

Course, Duration, and Termination.—Dementia paralytica is a chronic disease, but its duration can not be fixed very accurately, owing to the uncertainty which attends the time of the initial symptoms. It may be said that the cases vary in duration from one to ten years. It is true, deaths have been reported as occurring within a year, or in a few months, but there must be doubts in regard to the diagnosis in such cases. When the disease begins by apoplectic phenomena, the progress may be more rapid; and, when such attacks occur during the height of the malady, the progress downward is accelerated, although the injury caused by the apoplexy is largely recovered from. The usual course is a gradual increase in the paresis; the countenance becomes more blank, expressionless, and the muscles more relaxed; irregular jactitations occur in the facial muscles whenever speech is attempted or emotions are felt; the mode of speech becomes more and more stammering, and, as the memory becomes more and more deficient, words are omitted so extensively that the speech is unintelligible. The voluntary efforts are so enfeebled that no movements can be undertaken, and hence the patient sits motionless, or is finally bed-ridden, passing his urine and fæces involuntarily. Toward the end the nutrition fails, the body wastes, and an extreme emaciation is the result; rarely the face is full and flabby, the abdomen prominent.

The tongue becomes more and more paretic, swallowing increasingly difficult, and particles of food drop into the larynx, exciting suffocative attacks. Death may be caused by a pneumonia thus excited, or may occur by an apoplectic seizure, or in the coma succeeding a fit, or may be due to the exhaustion resulting from bed-sores. A considerable proportion are carried off by phthisis. It occasionally happens that a remarkable remission takes place in the condition of the general paralytic when it seems hopeless. The speech improves, the paresis of the muscular system disappears, and normal strength is restored, reason and judgment return again, and hallucinations and illusions no longer occur. This remission may last a short time, the disease revive, and the progress into its worst phases be again very rapid. On the other hand, the remission may pass on to complete restoration, the patient being restored to his friends and his work in life. This fortunate result is extremely uncommon, but has occurred often enough to require the utmost circumspection in giving an opinion. Except these cases, there is little to encourage in the course and results of this melancholy disease.

Diagnosis.—The differentiation of dementia paralytica is easily decided when the symptomatology is complete. The expansive ideas, the paralysis, the failure of memory, the lack of all moral feelings, sufficiently indicate the nature of the malady; but the cases not fully developed may be recognized with difficulty. The defects of speech, of intelligence, and the existence of paralyzes with ataxic symptoms, serve to distinguish dementia paralytica from posterior spinal sclerosis. From senile dementia the differentiation is made by reference to the expansive ideas, the moral state, the peculiar affection of speech, the existence of ataxia and paralyzes, and the age at which the phenomena became manifest.

Treatment.—Above all other cases, if we except acute mania, and the suicidal, there are none needing more the restraint of asylum treatment. In the attempt to put them into the asylum early, serious difficulties are encountered; for they are very plausible, and easily obtain legal assistance. Above all things, these subjects require rest, both of body and mind, and careful alimentation. The most suitable remedies are lactophosphate of lime and cod-liver oil, with quinine and morphine, to improve the nutrition of the brain and to obtain repose at night. To quiet restlessness and procure sleep, hyoscyamine ($\frac{1}{30}$ to $\frac{1}{10}$ grain) has been used with excellent effect hypodermatically. Chloral and morphine are often indispensable for this purpose, and in considerable doses. Entire rest, sufficient sleep, and a nutritious and careful alimentation, offer the best prospects of affording relief in this disease. Good results, of a temporary character, have been obtained from physostigma, and lately Ginna reports that full doses of ergot have proved remarkably effective; but it is obvious that

only in an early stage of the disease could any real improvement be accomplished.

SYPHILIS OF THE NERVOUS SYSTEM.

Definition.—By *syphilis of the nervous system* is meant deposits of the secondary and tertiary stages, so called, in the meninges, in the substance of the brain and cord, and in the peripheral nerves.

Causes.—The nervous system is affected coincidentally with the other viscera. The disease, pursuing its regular course, attacks the skin and mucous membrane, then the deeper organs and tissues. There is no fixed period for the appearance of syphilitic deposits in the nervous system. Susceptibility increases the rate of diffusion of the poison, and as there may be variations in its intensity, so there may be considerable differences in the time when the viscera are reached. It may be stated, in general, that the infection of the nervous system takes place during the later secondary or early tertiary period—in from one to three years usually; but it may occur within one year, or be postponed twenty years. In a large number of cases—the author has seen several—the nervous is the only secondary affection; but usually other lesions have existed, and in one third relapses have occurred. The disposition of syphilis to attack a particular part may be determined by existing injury or disease, or hereditary or acquired tendency to disease; and this is true of syphilis of the nervous system. All the causes, therefore, that tend to bring about disorders in the nervous system will determine attacks of syphiloma.

CEREBRAL SYPHILIS.

Pathological Anatomy.—The syphilitic masses, known as *gummata*, form in the subarachnoid space, or on the inner surface of the dura, and grow toward the brain. There is also a syphilitic pachymeningitis, which occurs at the convex surface of the hemispheres, especially forward on the anterior lobes, and in the middle fossa about the *sella turcica*. It is the external form, and is usually associated with bony lesions, and with the two forms of gummata. These, springing from the inner surface of the dura and from the subarachnoid space, are the most important of the syphilitic new formations. The first variety of gummata consists of a soft, reddish, translucent mass, composed of round cells and nuclei, spindle and stellate cells, distributed through the tissue of the part; and hence the density of the resulting mass is determined by the character of the tissue in which these cells are deposited. A number of cells may be closely packed in a considerable interspace, forming an alveolar arrangement, or, exuded into a reticulated tissue, will have a corresponding appearance. The new tissue contains capillary blood-vessels, and there may be extrava-

sations by their rupture. This form is not separated by a sharp boundary from the normal tissue, but the cells push out into their surroundings. The other form of gumma is not so soft and translucent, but is dry, firm, and yellowish, so that it is sometimes said to be fatty, but is really a cheesy transformation. They exist in two forms: as a diffuse infiltration, and in circumscribed, well-defined masses, varying in size from a pea to a pigeon's-egg. A favorite site of this gumma is inclosed between the two layers of the dura, where it may attain considerable size. When the gummata form at the convexity, it is found that the granulation-tissue has completely united and blended the membranes, so that they are not distinguishable. Here the yellow masses may lie imbedded in the grayish-red gumma, and about the mass, the brain-substance into which the neoplasm projects, is in a state of white or red softening. At the base the gummata, developing, fill in all the interstices around the chiasm, the crura, and the pons. Here the grayish-red growth is chiefly seen. By developing into the adjacent brain-substance, it causes softening. A syphilitic new formation also occurs in the vessels of the base. The affected vessel is thickened, grayish, and hard, by the deposits which form a cylinder; the lumen of the vessel is encroached on, so that it transmits only one half or one fourth the usual quantity of blood. When this change occurs in several of the vessels, the cerebral circulation is much embarrassed. It will suffice to say that the changes consist in the formation of granulation-tissue in the tunics of the vessel, the morbid process beginning in the intima. Besides the gummata, the meninges may be affected by a syphilitic inflammation, which consists in the formation of thick and rather tough patches, which do not differ in structure from the gummata. Inflammation may also take place in the brain-substance, and terminate in softening.

Symptoms.—The first symptom is headache; it is usually very severe, and has this peculiarity, that it is much worse at night, and may indeed be felt only at night. The pain may disappear spontaneously, to return again, sometimes after a brief and sometimes after a long interval, but is usually continuous; * it is increased by a slight tap on the head, and its position may indicate the seat of the lesion (Lancereaux). The severe nocturnal pain causes wakefulness, but this symptom may be present when there is no pain. Vertigo, confusion of mind, irritability, inability to apply the mind to any subject, and melancholy, with suicidal feelings, are symptoms experienced with more or less severity from the time when the new formations begin to develop, and may be due to congestion as supposed by Lancereaux, but also to compression of the intra-cranial contents. After a time, fainting-attacks occur without any special cause; weakness is experienced in the

* Lancereaux, "Treatise on Syphilis," Sydenham Society edition, vol. xi, p. 46.

legs, which give way unexpectedly; there may be defects of speech from inability to articulate; loss of the memory for words, exceeding slowness of speech; dimness of vision (amblyopia), with double vision, unequal pupils, strabismus, the ophthalmoscopic examination showing swollen disks, distended and tortuous vessels, etc.; noises in the ears and dullness of hearing; there may be maniacal symptoms, but more frequently the kind of mental defects mentioned above; epileptiform attacks succeeding to the fainting, and they may be partial, limited to one extremity, without loss of consciousness, or general, with unconsciousness. There may be, and usually are in basal deposits, especially those situated in the middle fossa, the usual site, defects of coördination, unstable gait, excessive vertigo, nausea, and vomiting, rapid impairment of vision, swollen eyelids, bleeding at the nose, etc. There are other motor defects, besides the impaired coördination and reeling gait: paresis of the muscles of one side, including the face, coming on slowly without an apoplectic seizure; there may be a mere weakness of one extremity, dragging of the foot a little, inefficient use of an arm, but still preservation of its motions, or it may be limited to one side of the face. In many cases there are, besides the motor disorders, bilateral affections of sensibility; there may be neuralgia (tic-douloureux or sciatica), but more frequently the sensations are depressed—there are extensive tracts on both sides, of complete loss of the sense of pain (analgesia) and of the sense of touch (anæsthesia), which, again, in other cases, may be more or less perfectly preserved.

There is another group of cases in which, preceded by the symptoms which announce the growth of the new formations, but which may, however, be not very decided in their manifestation, there occur sudden apoplectic seizures, varying in severity from profound unconsciousness to a momentary dazed feeling, after which a hemiplegia is found to exist (Huebner). These attacks with the resulting lesions may proceed in the usual way of a hemiplegia from intracranial hæmorrhage or other lesion, of course very much influenced by the treatment, but in a certain proportion of the cases they lie in a somnolent or partly somnolent condition, from which they may be awakened, but at once lapse back. These attacks are usually preceded by headache, by a feeling of exhaustion, and by a stupid, inactive mental state, which may pass slowly into the condition of somnolence. During this state, acts are performed like those of a somnambulist, as in getting up to urinate, etc.; and when roused they awaken, gaping and yawning, but coherent, yet soon lapse back into stupor, with an air of protest at having been disturbed. These periods of somnolence vary in duration; usually continue from night to the following afternoon, and, as in a case lately seen by the author, the usual times of sleep are disturbed by severe nocturnal headache. Often, but not always, these somnolent periods are accompanied by fever of a remittent

type. The somnolent period may last a few days, even several weeks, and may proceed to deeper coma ending in death, or the stupor may grow less dense, the intervals of wakefulness longer, and ultimately the somnolence disappears entirely. Cerebral syphiloma manifests itself by still another group of symptoms, namely, those of dementia paralytica. It begins with various symptoms of irritation in the intellectual sphere—confusion of mind, irritability, melancholy of an expansive kind, and ideas of grandeur. These symptoms may appear and disappear, and long intervals elapse, until at length symptoms of weakness come on, with such abnormal sensations as numbness, tingling, and formication, followed by inability for any considerable exertion, incoördination of movements, paralyses. The mental condition ultimately is that of dementia.

Course, Duration, and Termination.—There are no maladies in which the results of treatment are more conspicuous for good, and which are more influenced in their course, duration, and termination. The second form of Huebner, characterized by the apoplectic phenomena, followed by hemiplegia, is the shortest in duration, the lesions being chiefly in the vessels. Even if a cure does not take place, improvement may be effected, and the duration not be less than four years. In the second form, the opportunities for successful treatment are numerous, and the results under an appropriate medication very striking. Without treatment, weeks and months may pass before the final result is reached. The form, so like dementia paralytica, is more protracted, is subject to great fluctuations, and may continue for several years. Notwithstanding the curability of many cases—those, for example, with hemiplegia, or local paralyses, and with repeated epileptiform seizures—yet many cases resist the best-directed efforts, and for reasons that are obvious: the gummata, by pressure, produce softening and destruction of nerve-tissue, which can not be replaced. Furthermore, syphilitic cerebral affections manifest a great tendency to relapse after apparent cure.

SPINAL SYPHILIS.

Pathological Anatomy.—As in the brain, gummata spring from the internal surface of the dura, grow into the nervous matter, and unite the membranes in a compact mass. They have the structural peculiarities of gummata in the brain and elsewhere (Moxon*). Softening of the cord is a result of the presence of these new formations; partly due to pressure and partly to development inwardly of the neoplasm. Syphilitic disease occurs in the bones of the vertebræ, in the connective tissue, and in the outer layer of the dura, producing the symptoms of compression.

* "On Syphilitic Disease of the Spine," "Guy's Hospital Reports," vol. xvi, 1870.

Symptoms.—Long after, often many years after, the specific local lesion, deposits occur in the spinal canal. According to the author's observation* the spinal troubles may be coincident with the development of fresh tertiary symptoms elsewhere. The most constant symptom is a deep-seated pain in the dorsal or lumbar region, increasing at night; a pain of such severity as to require powerful anodynes to obtain sufficient relief for sleep. There may or may not be tenderness on pressure. Usually a great deal of pain is experienced in one or both of the sciatic nerves, and tingling, numbness, and burning sensations in the legs and feet. More or less weakness, a strong sense of fatigue on slight exertion, stiffness and cramps are experienced in the muscles of the spine, of the neck, and of the extremities. As the disease is developing, the general system sympathizes to a remarkable extent; a peculiar earthy hue of the face, emaciation, and debility are observed. The symptoms may continue at this point for a long time, or partial improvement take place, and then, after some weeks or months of inaction, more serious symptoms come on. When the symptoms become active again, paralysis begins and proceeds with great rapidity, and becomes so complete that not a toe is movable. The paralysis may be due to disease of the dorso-lumbar enlargement, and both lower limbs be completely paralyzed (paraplegia) as to motion, sensation, and the reflexes. The sphincters will also be involved, and incontinence be added to the other troubles. There may be partial paralysis, one limb involved. When the arms are affected, there will be oculo-pupillary phenomena, and the respiratory muscles will be paretic or paralyzed if the disease is high up in the cervical region. These spinal troubles of syphilitic origin may be associated with corresponding cerebral lesions, when, of course, the symptoms will partake of both. There is a form of acute spinal paralysis described by Huebner which comes on during the first secondary symptoms, and is characterized by a sudden paraplegia or paralysis of one arm and the opposite leg. In a few hours, or a day or two, the mischief is wrought, and the paralysis complete.

Course, Duration, and Termination.—The course of the principal forms of spinal lesions is very protracted, and they appear long after the local primary. Rightly treated they get well promptly, but, as is the case with the cerebral disease, they are prone to relapse, yet the ultimate cure is probable. When paraplegia has occurred with absolute paralysis, a cure may often be effected in a few weeks; but that this favorable termination shall take place it is essential that the injury be recent. If the cord has been damaged, permanent disability will remain, although the disease may be arrested. Old cases may terminate fatally by exhaustion from cystitis and bed-sores. The acute form, described by Huebner, seems to be very unmanageable,

* "On Syphilis of the Nervous System," "The Clinic," 1874.

and to reach a fatal termination by extension upward. In the spinal as in the cerebral form, much depends on the treatment instituted.

SYPHILIS OF THE NERVES.

Pathological Anatomy.—The cerebral nerves seem to be chiefly if not the only nerves attacked by syphilis. The deposits may be exterior, and press on the nerve-trunks, producing a neuritis, which leads to atrophic changes and degeneration. A gumma surrounding a nerve-trunk unprovided with a sheath will grow into the tissues of the nerve, and syphilitic granulation-tissue may be deposited in places, and develop in the ordinary way.

Symptoms.—The results of such affections of nerve-trunks have a different expression according to the function of the nerve. Irritation of a sensory nerve produces pain in its peripheral distribution; but, if the nerve is destroyed, anæsthesia and analgesia are experienced. On the other hand, if a motor nerve is irritated, spasms or tonic contraction will ensue in the muscles to which this nerve is distributed; if the nerve is destroyed, paralysis ensues. As the cerebral nerves are usually affected, the same symptoms result from syphilitic neoplasms as have been described in connection with other neoplasms or tumors of the brain.

Diagnosis of Syphiloma of the Nervous System.—The first point to determine is the occurrence of syphilitic infection. The peculiarities of the syphilitic affections of the brain are their diffusion, the irregularity in the development of the symptoms, the simultaneous existence of irritation and depression, the periods of spontaneous improvement, the remarkable change in the condition of a patient receiving iodide of potassium or mercury in some form, etc.

Treatment.—In these affections the most marvelous change is wrought by sufficient doses of the iodide of potassium. No time is to be lost in its administration, and usually the largest doses are required. Sometimes mercury does better, and lesions do not yield until it is administered. It has been observed, also, that cases not yielding readily to specific treatment, will do so on the exhibition of pilocarpine to promote absorption.

CEREBRO-SPINAL NEUROSES.

EPILEPSY.

Definition.—By the term *epilepsy*, as here employed, is meant true or essential epilepsy, and not eclampsia, nor convulsion from such cause as tumor, abscess, etc., of the brain.