A great variety of phenomena, depending upon the extent and situation of the lesions, may accompany syphilitic hemiplegia; such as paralysis of various nerves, aphasia, mydriasis, optic neuritis, and epilepsy. Mental depression seems to be constant, and most patients either display a condition of complete hebetude or are excessively emotional.

Early and energetic treatment may accomplish the relief and even the cure of hemiplegia, but the prognosis is greatly influenced by the age and extent of the lesion. The arteries arising from the circle of Willis supply the most important regions of the brain, and are most frequently affected by syphilis; obviously, if but one is involved, the prognosis may be more favorable than if many are. The number and gravity of the symptoms will usually give an idea of the extent of the lesion. In a simple case of hemiplegia, probably only one or two vessels are affected, and complete recovery may take place, but when other symptoms, indicative of extensive disorganization of the brain, are exhibited, the prognosis must be less favorable. As a rule, perfect health is in no case restored, although the patient may present no conspicuous abnormality. We may say, however, that the prognosis in syphilitic hemiplegia is better than in the simple form.

Syphilitic hemiplegia usually occurs much earlier in life than the simple variety, which is not commonly seen before the age of forty years. In diagnosis, therefore, it should be remembered that syphilis is the cause of most of the cases of hemiplegia in the young and middle-aged. The fact that a patient rarely loses consciousness when attacked by syphilitic hemiplegia, is an additional diagnostic point of importance.

Syphilitic Epilepsy.

This is of frequent occurrence in cerebral syphilis, and, like non-specific epilepsy, presents two forms, the *grand mal* and the *petit mal*. Headache, increasing in severity, always precedes an attack. The symptoms of the severe form are similar to those of the non-specific variety, consisting of sudden loss of consciousness, tonic followed by clonic spasms, facial distortion, foaming at the mouth, and stertorous respiration. According to some authors, the epileptic aura and cry are absent. Such convulsions generally occur at short intervals, and frequently, with distinct regularity, every ten days or once a month. Instances of their regular occurrence in the evening and at night have been reported, but, as a rule, they come on at no definite time. In some cases consciousness returns in a few minutes, in others the patient remains in a stupid condition for hours, and may not be fully restored for several days. After the seizure the headache may be much less severe for a time, but, unless treatment is followed, its intensity soon returns.

The course of syphilitic epilepsy is uncertain, and may be greatly modified by treatment. When convulsions follow a long prodromal stage, in which symptoms of mental disturbance have been particularly severe, the prognosis must be rather unfavorable; cases in which they follow a short period of headache generally yield to proper treatment, as we have several times observed. Tonic spasms may precede or follow an attack of hemiplegia, aud are often seen in connection with permanent or intermittent aphasia. They are generally caused by pachymeningitis, though probably, in some cases, as claimed by Jackson, irritation from a tumor is the exciting cause.

The intervals of syphilitic epilepsy, unlike those of apparent health in the simple form, are marked by symptoms of mental disturbance, which tend to increase, and may finally end in dementia.

The mild form, called by Charcot partial syphilitic epilepsy, may exist independently or combined with the severe form. The paroxysm may begin either with a twitching of one side of the face, a turning of the tongue to one side, a tendency on the part of the patient to whirl around, extreme giddiness, general trembling, or great weakness, or cramps of the extremities, which are followed by loss of consciousness and a convulsion, consisting either of slight muscular tremor or of general tonic spasm. The seizure may be limited to a single limb, or to one side of the body, and in some cases amounts to nothing more than slight rigidity. The severity and length of the attack are much less than in the *grand mal*.

Frequently there is no convulsion at all, but the patient, while talking or in performing any act, becomes unconscious, and is seen to stare vacantly. If sitting, he becomes motionless; if walking, he does not fall, but proceeds in an uncertain aimless manner, and, if in the midst of conversation, he suddenly becomes obtuse and fails to comprehend any question addressed to him. While in this condition, which may last only a few seconds or even twenty minutes, he may perform rational acts, such as paying properly for a purchased article, or he may even walk along without staggering, and when his senses are restored, he may recall indistinctly or not at all what he has said or done.

Dr. Hughlings Jackson has described a form of seizure which he has found to be caused by syphilis, and to be accompanied or followed by optic neuritis. It begins unilaterally as a mere twitch, a slight rigidity, or a violent convulsion, in most cases in the thumb and forefinger. It may be limited to the arm, along which it extends, or it may also involve the face of the same side; it may reach the leg, and constitute a hemispasm, or finally it may proceed to general convulsion. During the intervals, which vary in length, a course of symptoms, similar to those of the *grand mal*, though perhaps of milder character, may be observed.

The diagnostic points of syphilitic epilepsy are:

1. The history of the patient.
2. The paroxysmal headache.
3. The frequency of mental disturbance.
4. The frequent coexistence of optic neuritis, hemiplegia, aphasia, and paralyses of various nerves.

5. The age of the patient.
6. The result of treatment.

Simple epilepsy is usually developed before puberty, whereas that caused by syphilis generally occurs between the ages of twenty and thirty, the period when syphilis is most frequently contracted. The former is either uninfluenced or aggravated by the iodide of potassium and mercurials, whereas their influence on the latter is favorable, and, in some cases, curative.

Syphilitic Paraplegia.

Though the spinal cord is attacked by syphilis less frequently than the brain, at least one-half the cases of paraplegia are of syphilitic origin.

The symptoms are not strongly marked. The patient, who may or may not suffer from pain in the back, notices slight weakness of the lower extremities, and may also complain of one or more of the following symptoms: darting pains and spasms in the legs, numbness, tickling, or aching pains in the feet, hyperæsthesia, anæsthesia, dermatalgia, and formication. Loss of coördinating power may be observed. There is usually progressive weakness in the expulsive power of the rectum and bladder. This condition may remain stationary for a long time, or it may improve temporarily, but, unless treatment is adopted, complete paralysis of both legs finally ensues. On the other hand the development of paraplegia may be much more rapid.

General sensation may be preserved, slightly impaired or wholly lost. Exceptionally it is destroyed while the motor function remains perfect. After the establishment of full paralysis, there may be short intervals of slightly restored power, or there may be jerking of the muscles.

Paraplegia may be the only manifestation of syphilis existing at this time, but frequently there are evidences of lesions in the brain, such as headache, vertigo, mental impairment, paralysis of one or more cranial nerves, particularly those supplying the muscles of the eyes, or optic neuritis. Mydriasis has also been observed. The presence of any of these latter symptoms confirms the diagnosis of syphilis, which is ordinarily less clear in this than in other nervous affections of specific origin. Careful inquiry into the history and age of the patient is demanded. Simple idiopathic paraplegia generally occurs later in life than the syphilitic form, and the latter, like all specific nervous affections, is greatly influenced and frequently cured by treatment, which should be adopted early in all cases, even in those of doubtful character.

The prognosis, unless treatment has been long delayed, is favorable.

The causes of syphilitic paraplegia are lesions of the vertebræ, of the spinal meninges, and tumors which by pressure on the cord lead to myelitis and softening.

Cases thus far observed indicate that paraplegia is a later manifestation of syphilis than hemiplegia and epilepsy, though probably the lesions which cause it may be developed as early as within the first year of syphilis. In the majority of recorded cases its invasion has occurred after the sixth year of infection. It may of course occur very much later.

Aphasia.

Various disturbances of speech, included under the term aphasia, frequently occur in the course of syphilis of the nervous system. These may consist merely of hesitation in speaking, called *embarras de parole*, or of inability to remember certain words in writing and in speaking, or of the use of utterly inappropriate words on all occasions.

Keyes and Van Buren have reported an interesting case of a man, who, prior to an attack of syphilitic hemiplegia, spoke English and French, besides German, his native language, but, during recovery, he could speak only French.

Syphilitic aphasia may be continuous or intermittent, and always accompanies other symptoms, which determine its origin, since it presents in itself no diagnostic features.

The prognosis depends to a great extent upon the early adoption of anti-syphilitic treatment.

Locomotor Ataxia.

Although so eminent an authority as Fournier claims that syphilis may be the cause of locomotor ataxia, we are inclined to hold the contrary opinion, which has the support of many prominent observers. Locomotor ataxia is known to be caused by sclerosis of the posterior columns, a lesion exactly limited to this portion of the cord, though often involving it to a considerable extent. The lesions of syphilis, on the contrary are patchy, and less diffused, and, moreover, always originate in investing structures, subsequently involving the cord itself. The staggering gait, lack of coördination, darting pains, and muscular spasms, caused by syphilis, may suggest locomotor ataxia; but the slow, definite progress of the latter affection, compared with the irregular grouping and uncertain course of syphilitic symptoms, renders the distinction clear.

Notwithstanding what has been written on this subject during the past three years by so many eminent men, especially Fournier and Erb, I am disposed to hold to the views above expressed. These observers have simply proved that, in a varying proportion of cases of locomotor ataxia a more or less clear or unsatisfactory history of syphilis is obtained. It is painful to read some of the evidence which is taken as conclusive of antecedent syphilis in these cases. Often a simple sore, observed years gone by, and followed by no manifestations, has convinced the observer that the ataxia from which his

patient was suffering was due to syphilis. The truth is, we have too much reasoning upon loosely-gathered statistics.

Chorea.

The spasmodic muscular movements caused by syphilis are irregular and occasional, and never constitute complete chorea. Pre-paralytic chorea, characterized by spasmodic contractions, without loss of consciousness, preceding an attack of hemiplegia or paraplegia, has been already referred to; similar contractions not infrequently follow these paralyses, and the condition is then called post-paralytic chorea.

The spasms vary in intensity from a mere twitch to a decided convulsion, and may be limited to an arm, or may at the same time include the face; or they may occur unilaterally in the arm and the leg. They do not, as a rule, become general, and always coexist with other symptoms of graver importance.[1]

Pseudo General Paralysis.

The relation of syphilis to general paralysis of the insane has been until recently a disputed question. While some authorities claimed that the latter affection was in a measure due to syphilis, others believed that its occurrence in a syphilitic subject was a mere coincidence. The subject has lately been carefully studied by Mickle and Fournier,[2] who have arrived at the conclusion that syphilis does not produce an affection resembling in certain respects the general paralysis of the insane, but that the two diseases are not identical.

This affection, to which Fournier gives the name *pseudo general paralysis of syphilitic origin*, consists of an association of intellectual, sensory, and motor disturbances, evidenced by numerous and complex symptoms. The intellectual disorder is indicated by cerebral excitement and exaltation of ideas with incoherence, and by gayness of spirits alternating with hebetude, together with delirium and even mania. The motor disturbances are well marked, and consist of uncertain movements without paralysis, trembling, and imperfect prehensile power of the hands, sudden loss of equilibrium, imperfect coördination, staggering gait, and hesitating speech. Besides these, there are frequently special affections, such as trembling of muscles and partial paralysis, ephemeral or persistent, and also certain symptoms of cerebral congestion; of the latter may be mentioned a sense of weight and pain in the head, dizziness, sudden dazzling sensations, vertigo, and various impairments of sight and hearing; to these should be added epileptic and epileptiform convulsions, and sudden seizures of an apoplectic character. Of course, we never meet with all the above symptoms combined, but in all cases many of them are associated.

[1] Brit. and For. Med.-Chir. Rev., Lond., July and October, 1876; April, 1877.
[2] La syphilis du cerveau, Paris, 1879, p. 333.

The peculiarities of this syphilitic affection are that the paralytic symptoms predominate; that symptoms appear in a capricious and irregular manner, fibrillary contractions of the facial and lingual muscles being absent; that there are no well-defined exalted ideas; and that behind all there is generally a syphilitic cachexia.

After considering the subject exhaustively and criticising the loose manner in which the term "syphilitic insanity" is used, Mickle gives the following points of differential diagnosis between true general paralysis and the pseudo general paralysis of syphilis:

1. Distinct history or symptoms of syphilis.
2. Preceding cranial pains, nocturnal and intense.
3. Exaltation less marked, less persistent, and perhaps less associated with general maniacal restlessness and excitement.
4. Sometimes complicated by palsies of one or more cranial nerves, or by hemiplegia, paraplegia, etc., having the character and course of syphilitic palsies.
5. The greater frequency of optic neuritis, early amaurosis, deafness, local anæsthesiæ, vertigo, and local rigid contraction.
6. The affection of the articulation is paralytic rather than paretic, and usually speech is not accompanied by any facial or labial tremors.
7. Cerebral or spinal meningitis or pachymeningitis.
8. Great variety of motor and sensory symptoms, their capricious association or succession and their transitory character, and the absence of general progressive muscular paresis.
9. Effect of antisyphilitic treatment.

Mickle adds that in the simple affection the faradic contractility of the muscles of the extremities becomes considerably and progressively lessened, while in syphilis it is normal, or but slightly impaired.

Treatment.

In the treatment of the nervous affections caused by syphilis, and especially those involving the brain and spinal column, there must be no halfway measures. A fraction of a grain of corrosive sublimate, or three to five grains of the potassium iodide, administered three times a day, will do no more good than would the water in which they are dissolved. If the patient's life is to be saved, or at least serious and permanent consequences be averted, iodine and mercury must be used in heroic doses.

If the patient has not already taken the iodide of potassium, it may be well to commence with the moderate dose of fifteen grains (1.00) after each meal, for fear he may be one of those exceptional individuals in whom the iodides exercise a poisonous influence, and if he is found to bear it well, the dose should be rapidly increased. But when his tolerance has already been tested, a dose of half a drachm (2.00), or, in urgent cases, even a drachm (4.00), three times a day, is not too much to commence with, and it should be increased—

say, by the addition of five grains (0.30) every other day—until amelioration of the symptoms takes place, or at least two drachms (8.00) for each dose have been reached. At the same time free mercurial inunction every night should not be neglected. For more minute directions I would refer to the chapter on the treatment of syphilis.

CHAPTER XXI.

SYPHILITIC AFFECTIONS OF THE MUSCLES AND THEIR ACCESSORIES.

Syphilitic affections of the muscles, although noticed by Astruc,[1] attracted but little attention until investigated during the present century, more especially by Boyer,[2] Ricord,[3] Bouisson,[4] Notta,[5] and Virchow.[6] The most important contributions, however, to this subject are the elaborate lectures by Mauriac,[7] published within a year.

Syphilis affects the muscles in two ways: 1, by an abnormal development of the connective tissue in the interfibrillar spaces,—*the diffuse form*; 2, by the deposit of gummy material in circumscribed masses,—*muscular tumors.*

Diffuse Form—Muscular Contraction. — According to Virchow, this lesion is analogous to that produced by rheumatic inflammation. "In the interspaces between the muscular fasciculi, a connective tissue is developed, which hardens and results in atrophy, and finally in the destruction of the primitive muscular fibrils." We thus find at the outset the presence of abnormal nuclei, cells, and fibres in the cellular tissue, and afterwards a secondary degeneration of this new formation, resulting in atrophy of the normal elements, contraction of the muscle itself, and, in some instances, calcareous and bony deposits. This lesion usually escapes observation until the contraction of the muscle, interfering with motion or producing flexion of the limb, attracts attention.

One or more muscles may be attacked. Those most frequently affected are the flexors of the upper extremity, and especially the biceps. Notta met with six cases, in two of which the disease was confined to the biceps; in two others, to the biceps and supinator longus, and in the remaining case to the flexors of the fingers. The biceps has been affected with the same frequency in the cases reported by other observers.

In each of the ten cases reported by Mauriac the biceps was the seat of this affection; in nine it was the only muscle involved, while

[1] A Treatise of Venereal Disease, etc., translated from the Latin, London, 1754, vol. ii., p. 15.
[2] Traité pratique de la syphilis, Paris, 1836.
[3] Notes to Hunter, 2d Am. ed., 1859, p. 458.
[4] Gaz. méd. de Paris, 1846, p. 211, and Tribut à la chir. moderne, t. i., 1858, p. 527.
[5] Mém. sur la rétraction muscul. syph., Arch. gén. de méd., December, 1850, 4e série, t. xxiv., p. 413.
[6] La syphilis constitutionelle, p. 105.
[7] Leçons sur les myopathies syphilitiques, Paris, 1878.