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.

in one case the triceps was attacked at the same time. In seven of these cases the left biceps was affected, in two both right and left, and in only one was the muscle of the right side alone affected. When both biceps and triceps are involved muscular anchylosis of the elbow results.

The contraction comes on insidiously, and the first symptom noticed by the patient is an inability to extend the limb. On examining the affected muscle, no change is perceptible by palpation either in its size or texture; its power of contraction is normal; and there is simply a diminution in length, as shown by its tension when the limb is forcibly extended. The tendon of insertion of the biceps is always prominent and tense, and the muscle itself appears to be in a state of partial contraction.

In neither of Notta's six cases was the fleshy portion of the muscle sensitive to pressure; but in five, pain was excited by pressing upon one or both of the tendinous insertions, and by forced extension.

According to Mauriac spontaneous pain was absent in some cases, while in others the muscle was the seat of a dull aching sensation, which was subject to exacerbations. In other instances the patients suffered from neuralgia of the muscle or other parts. The contraction increases, slowly in most cases, but rapidly in some, up to a certain point, when it remains stationary. In five cases in which the biceps was affected, the angle formed by the arm and forearm, when the latter was extended to the utmost, measured 160°, 135°, 130° and 90°, respectively. In another case, the ring and little fingers were completely flexed upon the palm of the hand.

In none of Notta's cases had the patients ever suffered from rheumatism, which, therefore, could have had no part in producing the muscular contraction; but all presented unquestionable syphilitic symptoms, which in three belonged to the tertiary; in two to the secondary; and in one to both the secondary and tertiary periods.

Mauriac, however, regards this as a precocious rather than a tertiary affection. He has observed it as early as the second and as late as the fifteenth month of syphilis, and thinks that we may fix upon the tenth month as the average date of its appearance. It occurs in the mild rather than in the severe cases of syphilis. He thinks that rheumatism has no etiological relation to this affection, which is myo-neuropathic in its nature; in other words, syphilis affects the peripheral nerves and muscles. The intensity of the diathesis has slight influence upon its development; of nine cases but one was severe, five were mild, and three were of medium severity. It is accompanied by non-ulcerative more frequently than by ulcerative lesions.

This affection may last months or years, and, while it yields with moderate promptness to treatment, it is capable also of spontaneous cure. Its course is not always uniform, since it is liable to remissions and relapses. Mauriac believes the lesion to be a subacute myositis. He passed a galvanic current through muscles thus affected, and found impairment of motion and of sensation.

Under the name of "chronic syphilitic tetanus," Deville[1] has reported a case in which a large number of muscles were involved, and death ensued from contraction of the muscles of the pharynx, which was impassable to a probang. Notta coincides with Deville in regarding the disease as syphilitic.

In the opinion of Mauriac, syphilis plays an insignificant part, or perhaps no part at all, in the production of this affection. He looks upon it as tetanus, *névrose tetaniforme generalisée*, occurring in a syphilitic.

The treatment of this affection consists in the combined administration of mercurials and the iodide of potassium. Friction with stimulating liniments and inunctions of mercurial ointment have proved beneficial in our experience. Brisk rubbing and massage may also be tried with the daily use of the faradic current. As is true of other syphilitic symptoms, the disease is likely to return if treatment be suspended too soon.

MUSCULAR TUMORS.—Our knowledge of syphilitic tumors of the muscles is due in a great measure to M. Bouisson, late professor of surgery at Montpellier.

These tumors are dependent upon circumscribed deposits of the same material as is found in gummata of the subcutaneous cellular tissue, and in most of the syphilitic affections of the viscera.

Gummy tumors have been met with in the glutæus maximus, trapezius, sterno-cleido-mastoideus, vastus externus, pectoralis major, and some other muscles; and in the walls of the heart by Ricord,[2] Lebert,[3] and Virchow.[4] Tubercles of the tongue are frequently seated in the muscular as well as in the cellular tissue; and many of the sloughing ulcers of the velum palati, pharynx, and larynx, commence as gummy tumors of the neighboring muscles, the mucous membrane being involved secondarily. Mention has also been made of similar tumors in the lips, which are said to have been mistaken for epithelial cancer, but doubt may be entertained whether they were not merely the induration underlying labial chancres.

With regard to their mode of origin Bouisson says: "It is difficult to determine whether the earliest changes take place in the muscular fibrils or in the intervening cellular tissue; although analogy would lead us to believe that it is the fibro-cellular element connecting the fleshy fibres or serving as their sheath, which is first involved. But in advanced cases—no matter what the mode of termination, whether by suppuration or induration—all the anatomical elements appear to be affected; and, according to the progress of the morbid action, the muscular fibres are either surrounded by a material of new formation or are softened and destroyed, or, again, are transformed

[1] Bull. Soc. Anat. de Paris, 1845, p. 276.
[2] Iconographie, Pl. XXIX.
[3] Traité d'Anatomie Pathologique, t. i., Pl. LXVIII., Fig. 5.
[4] La Syphilis Constitutionelle, p. 108.

into indurated, subcartilaginous or even osseous tissue. Such at least are the different stages I have met with in these tumors.

"In the *first stage*, the muscle is the seat of a local and circumscribed swelling of greater consistency than œdema. Upon a cut surface of the diseased tissue we can recognize decolorized muscular fasciculi in the midst of a plastic effusion of a grayish color.

"In the *second stage*, the adventitious deposit softens, and if the attendant inflammation continues of a chronic character, is transformed into a viscid, stringy liquid, resembling a solution of gum. If, on the contrary, acute inflammation sets in, or if the tumor has been attended from the outset with constant pain and an increase of temperature, pus (?) is formed in the centre of the muscle, the fibres are softened and destroyed, and more or less disorganization takes place.

"In the *third stage*, those syphilitic tumors of the muscles which do not suppurate, become indurated. Like periostoses, they pass through successive stages of organization, and from being firm, become subcartilaginous, cartilaginous, and osseous. This final transformation, from its peculiarity and persistency, has especially attracted the attention of pathologists. I have seen a very remarkable example of it in the museum of the Faculty of Medicine at Strasbourg—an osseous mass of very considerable size developed in the substance of the quadratus femoris. Ossifications of the muscles and their tendons have frequently been observed in syphilitic persons with exostoses on various parts of the body. In the collection of my colleague, Prof. Dubrueil, is the skeleton of an Arab who was affected with syphilis, and in whom, besides numerous exostoses, there was ossification of a large number of muscles at the points of their insertion."

This "third stage," recognized by Bouisson, should rather be regarded as the termination of those muscular tumors which do not undergo softening.

More recent authorities also deny Bouisson's assertion that these tumors may terminate in suppuration; thus, Lancereaux (*op. cit.*, p. 261) says: "It is very evident that this author has mistaken for suppuration either a muscular lesion consecutive to changes in neighboring bone, or else the results of fatty transformation of the plastic elements of the gummy tumors themselves; the suppuration was not the effect of syphilis."

Mauriac also states that they never terminate in suppuration and considers this an important point in the diagnosis.

These tumors vary in size from that of a filbert to an orange; they are usually globular in shape; the integument covering them is unaffected.

They grow slowly and without inflammatory symptoms, and at first cause no inconvenience. They are of various shapes, globular, fusiform, or irregular, according to the nature of the parts in which they are seated. When superficial they become adherent to the aponeurosis, which becomes inflamed and hypertrophied. Being frequently developed near the ends of the muscles, the tendons are sometimes secondarily involved.

They are most easily detected when the muscle is relaxed, and their independence of the subjacent bone can then be best established. They excite little or no pain, unless the muscle be put upon the stretch, and their chief inconvenience is due to their interference with motion. They sometimes produce contraction of the muscles, but this is not a necessary result.

They usually appear late in the disease, but Mauriac has seen them in three cases as early as three and five months after infection, while we have observed a tumor in the sterno-mastoid muscle in the fourteenth month of syphilis.

They are almost always accompanied by other syphilitic manifestations, as nodes, exostoses, tubercles of the cellular tissues, or ulcerations of the fauces.

Their prognosis is good, particularly if they are attended to early, and their treatment is that of the advanced stages of the disease, viz., by means of the iodide of potassium and tonics, either associated with, or followed by, mercurials.

CONTRACTION OF THE JAWS.—Under this title Guyot and Beauvette describe a number of cases, in which there was inability to separate the jaws, and swelling of the masseter muscle. In some cases there is no history of syphilis, and in none is the affection clearly of syphilitic origin. Mauriac remarks of two of Guyot's cases that the muscles *at the end of three years* had not become sufficiently altered to render treatment inefficacious. Guyot says that syphilitic myositis of the masseters is difficult of diagnosis, since it may be confounded with a similar condition caused by cold or hysteria.

Its actual nature must be determined by careful examination of the parts and from the history of the case. He also suggests that several cases of contracture of the masseter, reported as incurable, were really syphilitic, and might have been cured in an early stage.

AFFECTIONS OF THE TENDINOUS SHEATHS AND OF THE TENDONS AND APONEUROSES.

For our knowledge of these affections we are indebted chiefly to Verneuil[1] and Fournier.[2] Under the name "dorsal hygroma," the former describes certain swellings which occur on the backs of the hands. These swellings follow the course of the tendons but never extend beyond the dorsal ligament; they are of triangular shape

[1] De l'hydropisie des gaînes tendineuses des extenseurs des doigts dans la syphilis secondaire. Gaz. hebd. de méd., Paris, Sept. 25, 1868.

[2] Note sur les lesions des gaînes tendineuses dans la syphilis secondaire; Gaz. hebd. de méd., Oct. 9, 1868.

with their base towards the fingers. They are due to effusion and yield a sensation of fluctuation; they cause little if any pain, unless of unusually large size, when the skin over them may be inflamed and painful. They occur in the early years of syphilis and are developed rapidly.

Fournier describes an affection of the tendons of the wrist, ankle, foot, etc., and says that any tendon may be thus attacked. The lesion is a hyperæmia of the sheath attended by serous effusion. The shape of the resulting tumors varies according to the conformation of the parts.

They are firm and elastic and sometimes fluctuate. The overlying skin is frequently reddened. They form rapidly, and are often attended with pain. Fournier believes that many of the early pains of syphilis are due to hyperæmia of the sheaths of the tendons, and especially that the pain sometimes present in the bend of the elbow, intensified by firm pressure, is due to inflammation of the tendon of the biceps.

Tendons may, in rare cases, be the seat of gummy infiltrations, which exist in the form of small subcutaneous tumors, usually unattended by spontaneous pain. After remaining indolent for a long time, they may break down, and form troublesome ulcers. Van Oort cites a case of gummy tumor of the third extensor tendon, seated over the middle of the metacarpal bone. Such a tumor might be mistaken for simple ganglion. When the tendon is attacked near a joint the latter may be secondarily involved.

The tendons are more subject to syphilitic changes near their insertion and in their thicker portions. The larger tendons and those most constantly in use are most frequently involved. Sabail reports a case of gummy tumor involving the tendo Achillis of each leg. Nélaton has twice found them in the tendon of the triceps cruris, and cases are on record, in which the ligamentum patellæ, the tendon of the sterno-mastoid muscle, the anterior tendon of the thigh and the flexor tendons of the legs were thus affected. Finally, Bouisson has reported a case of strabismus due to a gummy tumor in the tendon of one of the orbital muscles.

Syphilitic tumors of the aponeuroses are less salient and less circumscribed than those of the tendons. They consist of thickening of these fibrous envelopes, and are prone to attack the dense fasciæ of the limbs, particularly the fascia lata. These tumors run a course similar to that of tumors of the tendons, but they are not very prone to degenerate.

Affections of the Bursæ.

Our knowledge of the effect of syphilis upon the bursæ is still far from complete. Some observers think that congestion of these structures, possibly attended by serous effusion, may occur in the secondary stage of syphilis. This view seems to be supported by the occurrence of rheumatoid pains in the neighboring parts.

In the tertiary stage, affections of the bursæ are quite frequent. The bursæ over the patellæ are most commonly attacked. The lesion is a gummous infiltration with formation of connective tissue. It begins insidiously and without pain; the patient's attention is first attracted by a hard movable lump beneath the skin. It varies in size and shape in different bursæ. Over the kneejoint we have found tumors as large as a walnut or as an egg. The tumor may remain indolent for a long time, giving very slight discomfort. In some cases it is excessively hard, in others it is quite elastic. Sometimes the parts seem to be infiltrated with fluid. If not treated, and particularly if subjected to irritation, the tumor grows and becomes adherent to the overlying skin. Inflammatory symptoms appear, and the integument over the bursæ ulcerates. The inflamed and infiltrated bursa may sometimes be seen at the base of the ulcer. Under such circumstances the course of the lesion is very tedious. In other cases, even of very large tumors, treatment causes their absorption within two or three months. The lesion may be unilateral but frequently attacks both patellar bursæ. In many cases traumatism is an important exciting cause; in others the bursæ are secondarily involved by the extension of gummatous infiltration from adjacent parts. Relapses are quite frequent.

Keyes, who has written an excellent paper on this subject, has collected twelve cases; in three, the bursæ of both patellæ were involved, and in two the bursa of one patella only was affected; that over the tuberosity of the tibia once; that between the insertion of the semitendinosus and the lateral ligament of the knee, double once and single once. In the other four cases the bursitis was unilateral, once over the malleolus, once beneath a corn, once in the palm of the hand, and once over the olecranon. It occurs most commonly in women, and, according to Keyes, at an average age of thirty-five years. It may appear within one year after infection, as in two cases now under our care, but it is usually a late manifestation, being developed after the fifth year. In a third case of our own, ten years have elapsed since infection.

The treatment should be both internal and local. In quite a large experience we have obtained good results from the mixed treatment. Mercurial ointment externally hastens absorption of the subcutaneous tumors. In the ulcerative stage the neoplasm must be destroyed by caustics, of which potassa fusa is the most effective. Its application should be repeated as the case demands. The patient must be kept in bed, and excessive reaction prevented by water-dressings. The subsequent treatment is similar to that of gummous ulcers.