What would have become of it if we had done nothing?

Perhaps a cure would have taken place spontaneously; but that doubtless would have been only in case the young man had given up for a time the fatiguing occupations which had been the occasional cause of his trouble.

I have met several patients who, from the information furnished by them, appeared to me to have had tarsalgia of the first degree, and to have been cured without surgical treatment by refraining from long walks. I treated in my private practice a young girl, sixteen years old, who had been affected with valgus for a week, after having felt pain for a fortnight when walking. She was relieved by keeping the bed for a week, and by avoiding for some time thereafter prolonged standing and walking.

But as, in our young man, the tarsalgia was very marked, and had already lasted several weeks, and as the necessity of working for his living would have led him to endure the pain after obtaining a slight diminution by temporary rest, I had every reason to suppose that the tarsalgia would have passed first to the second degree, that in which the contracture and valgus no longer disappear by rest, but only during anæsthetic sleep; then to the third, that in which the muscles no longer relax, even during sleep, and may be considered as having passed to the condition of permanent shortening, which you know by the name of retraction; perhaps finally to the fourth, that in which the medio-tarsal articulations, or at least one of them, and especially the astragalo-scaphoid, are anchylosed by fusion. For one of the consequences of the slight arthritis, of which you have seen the first degree in this patient, is the formation of one or more anchyloses. A few years ago I showed, at the Hôpital de la Pitié, a man fifty years old, in whose left foot there was, together with an old valgus, a union of the astragalus and calcaneum; and he told us that at the age of eighteen he had had a sprain, which he did not think it necessary to have treated by a surgeon, and in consequence of which this deformity was produced. I should add that this anchylosis, after having troubled him for a long time, and having rendered long walks impossible, had ended by becoming indolent, and causing no further functional trouble.

You see, gentlemen, that in speaking to you of the course of this affection when abandoned to itself, I made no mention of suppuration. I should fear it, perhaps, if I had found at some points of the tarsal region a diffused swelling and doughiness with semi-fluctuation, such as we find in fungous synovitis or white swelling. Not only were these signs absent, but moreover the existence of valgus and contracture led us to dismiss the idea of an articular affection which might terminate some day in suppuration. For it is a remarkable fact, and one abundantly proven by clinical observation, that arthritis tending to suppuration is not accompanied by these symptoms (contracture and valgus), and when we see these latter appear, especially in a patient who shows no signs of scrofula, we know that the affection will end neither in articular suppuration nor in caries.

In this respect the prognosis was favourable; but it had this inconvenience, in case the disease had been abandoned to itself, it would undoubtedly have lasted several years, during which the young man would have been constantly disturbed in his occupations, and it might perhaps have ended in definitive retraction and anchylosis, which are always the cause of great trouble in walking until adult life has fairly begun.

Treatment.—It results from all that I have told you, that the chief indication in this case was to keep the foot motionless. In that way we could cause the pain to disappear, and with it the muscular contracture which was its reflex effect. It was also the means by which to obtain the cure of the articular lesions, the existence of which we had the right to assume; notably that of the osteitis and the ulceration of the cartilages. I am unable to tell you if this ulceration is capable of cicatrizing purely and simply, without restoration of the cartilage; or if the latter can be reproduced, which does not seem to me impossible at this early period of life. But I have had no anatomical demonstration on these points. I only know, from the results which I have obtained in a dozen patients whom I have been able to follow, that all the clinical phenomena of tarsalgia of the first degree may disappear after a rest of two or three months.

I therefore applied an immovable apparatus whilst the muscles were well relaxed. While the foot was kept turned inwards, I wrapped about it a thick layer of cotton batting, which I carried nearly half way up the leg; over this I rolled tightly a dry bandage, then another soaked in plaster mixed with a solution of one part of gelatine in a thousand parts of hot water. The plaster dried in a few hours. The patient remained in bed for six weeks without having the bandage removed; at the end of this time I let him sit up, and a fortnight later—that is, at the end of two months—I removed the bandage, and let him walk as much as he chose.

To-day, a week later, all appears to be in good condition. No pain, no contraction has reappeared. I hope the young man is cured, and I shall let him leave the hospital in a few days. I shall advise him to wear an elastic stocking and snugly-fitting shoes, so as not to turn or sprain the foot, and thus bring back the tarsalgia; also to come and see us from time to time; and if I notice that his foot has any tendency to turn outwards again, I shall make him wear a laced shoe, the sole of which will be nearly half an inch thicker on the inner than on the outer side, so that he will have to walk with his foot turned inwards.

Unfortunately, I am not certain that the cure is final and definitive. I have seen, in several patients who had been treated in this way, the pains, contractions, and valgus reappear a few weeks after they had again begun to walk, so that it was necessary to repeat the treatment. The reason doubtless was that the articular lesions were not completely healed; for you understand that in certain cases the ulceration of the cartilage is not cicatrized or repaired in two months, and it is to be regretted that there is no sign by which we can determine the persistency of the lesion after it has been sufficiently diminished by treatment to no longer occasion functional disorders, the reappearance of which is afterwards caused by walking and standing.

II. The other patient whom I mentioned at the beginning is eighteen years old. He thinks he sprained his left foot three months ago; he suffered but little from it, and kept at his work as house servant, remaining on his feet most of the day. For a few weeks he had moderate pains, which, like those of the preceding patient, were notably greater at night. Then he noticed that his foot turned outwards when he suffered most. This deviation disappeared by rest; but a fortnight ago it ceased to disappear, the pain became greater, and a week later the patient was obliged to enter the hospital.

The first and second days, after twenty-four and forty-eight hours' rest, we found that the left foot was flat, almost without any plantar arch. But this conformation is not connected with the present affection; it is old, perhaps congenital, although the young man cannot give us any categorical information on this point. In any case, it is as marked upon the right foot, which is the seat of no disorder, as it is upon the left, which has been lame for some time. Further, we find the same physical and functional symptoms as in the preceding patient; that is, deviation of the foot outwards. apparent enlargement of the astragalus, suppression of the lateral movements of the foot, pain upon pressure on the outer side over the calcaneo-cuboid articulation, and prominence of the tendons of the extensors and lateral peronei.

It was necessary to know if the shortening of the muscles, which was betrayed by the prominence of the tendons and the deviation outwards of the foot, was definitive and irremediable, or if it could disappear and be replaced by relaxation. You saw that the shortening persisted in spite of the repose. In order to ascertain if it could cease, I subjected the young man to the influence of chloroform, and after he had become well anæsthetized you saw that all the muscles were relaxed, and that I profited by it to turn the foot inwards, and fix it with a plaster apparatus.

In this case then, as in the preceding one, we had to deal with tarsalgia of adolescents, but it was tarsalgia with splay-footed instead of arched valgus. The succession of the phenomena—first, pain without contracture, then pain with temporary contracture, finally pain with prolonged contracture and valgus without intermittence—authorized me to believe that this was again a disease, the origin of which was in a lesion of the tarsal articulations, but in which the contracture, a secondary reflex effect, was liable to become of chief importance, because prolonged contracture might become retraction, that is, the muscles would be unable to relax, and as this retraction would be inevitably accompanied by immobility of the joints, the latter would be so much the more disposed to anchylosis. If I have obtained by means of the anæsthesia a permanent relaxation, if, the articular lesions disappearing under the influence of rest, the pains are not reproduced and no longer cause reflex muscular contraction, the articulations will be able to renew their functions, and the foot to re-establish itself in a normal condition. It was with this hope that I applied the plaster apparatus upon the foot placed in varus after anæsthesia.

I must now ask again if the explanation which I repeated here of the lesion which now occupies us is a sound one, and if we ought not to invoke the theory of M. Duchenne (de Boulogne). This theory is as follows: Splay-footed valgus presumes insufficient action on the part of the peroneus longus, since the action of this muscle, by its simple tonicity, is to maintain the hollow of the instep by drawing the first metatarsal bone downwards and outwards. The origin of the affection might then be in this muscle, which would contract too feebly, or, as the author says, might be the seat of an impotence. In consequence of this impotence the foot would flatten; the plantar nerves, having become painful by the increased pressure, would provoke by reflex action a painful contraction of the peronei and extensors; perhaps, even, the flattening of the foot might subject certain points of the articular cartilages to an unaccustomed pressure which would cause their ulceration.

I ought to say, however, that M. Duchenne, in his last article upon this subject,[1] does not say much about the articular lesions, or the origin of the pains. I do not clearly understand whether, in his opinion, these latter have their origin or their principal seat in the impotent muscle, in the muscles contracted consecutively, or in the nerves, or even in the bones and the articulations.

This is, furthermore, the objection which I address to all those who attribute valgus to a functional lesion of the muscles. Why this radiating pain? Why, above all, this pain on pressure when the muscles are relaxed and the patient at rest; this pain which, moreover, in most cases, is the initial phenomenon and precedes contraction for quite a long time?

In the present case I cannot admit the impotence, always very problematical, of whichM. Duchenne speaks. My chief reasons are that the flat-foot far antedates the pain, and that it exists upon the right side where there is no pain, as well as upon the affected left side; that the pain, as I have just said, was the initial phenomenon, and that finally before using anæsthesia we found the peroneus longus contracted as well as the peroneus brevis. Perhaps they will claim that this muscle, at first impotent, became afterwards contracted. I will grant it if they wish; but I ask how then will they prove this impotence to have been the cause of the trouble? Suppose the theory correct, it cannot be demonstrated by clinical study in cases like this one, where the foot was flat long before the appearance of painful symptoms.

I recognize, too, that M. Duchenne rests his theory of impotence upon a powerful argument; the cure of certain patients affected with splay-footed valgus by faradization of the peroneus longus. But this argument should not have too much weight. Whatever we may think of the theory, there will always be a singular functional lesion of the muscles in tarsalgia, and I understand how the passage of

[1] Duchenne, De la Crampe du Pied, ou de l'Impotence fonctionnelle du long péronier et de la Contraction fonctionnelle de ce Muscle. Union Médicale, tome xxxviii p. 599, 1868. It will be noticed that the case of splay-foot reported in this article was that of a woman forty years old, and not of an adolescent.

electric currents might advantageously modify this lesion and the trouble of innervation which causes it.

I do not accept then the theory of impotence, because clinical and anatomical study of the disease does not confirm it. But if necessary, I shall make use of the therapeutical resource offered us by M. Duchenne. If, after two months of immobility in a good posture, the pain and contraction return, I shall try electrization of the peronei and the anterior muscles of the leg. You may have seen last year a youth affected with flat-footed tarsalgia, who improved and seemed to be cured by twenty applications of electricity; but I still think, that, by reason of the presumed beginning of the disease with articular lesions, we shall do well to first combat these lesions by immobility, and to address ourselves to the muscular element only when it shall have taken a marked predominance, and an importance which it had not at the beginning.

III. Tarsalgia of the 3d degree with retraction of the lateral peronei; treatment by tenotomy.

Here is a new case of tarsalgia in a subject 19 years old. The foot is arched and in valgus. The extensor muscles relax by rest, but it is not the same with the lateral peronei; they remain tense and prominent under the skin. I anæsthetized the patient, but did not get them to relax. I am then justified in thinking that these muscles are definitively shortened by the production, consecutive to prolonged contraction, of the condition which we call retraction. The commemoratives are also favourable to the opinion that there was first pain in the articulations and bones, and that the contracture occurred afterwards. Now that the retraction exists, the muscular lesion has become the most important. For, even if the articular lesions should diminish, the foot would still remain deviated outwards, a condition which would make walking difficult and at times painful. I know that after a time this difficulty and this pain would cease, but still they would exist for a certain number of years. Moreover, instead of diminishing, the articular lesions might extend and terminate in the anchylosis characteristic of the 4th degree of tarsalgia, anchylosis which would still cause functional disorders for a certain number of years.

It is in cases of this kind that tenotomy of the lateral peronei is indicated. I consider it useless when the contracture can be overcome by rest or anæsthesia.

You saw me perform it yesterday on this patient. It consisted of a first time, in which I made a fold in the skin, and pricked its base with a pointed tenotome three finger-breadths above the external malleolus. In a second time I introduced through this opening, between the skin and the posterior face of the tendons, the blade of a pointed tenotome lying on the flat. I then turned the blade towards the tendons and divided them, one after the other. I was at once able to turn the foot inwards and fix it there with a simple roller bandage, and in four or five days, when the slight cut in the skin is healed, and we are sure there will be no suppuration, I shall apply a plaster apparatus to fix the foot and keep it slightly turned inwards. I have already performed this operation twice for tarsalgia of the 3d degree

(with retraction of the peronei). The patients met with no accidents, and left the hospital apparently cured. As they have not come back to me, I have reason to hope that the cure has been maintained.

If from the results of clinical investigation we had reason to think that the peroneus longus did not share in the retraction, and that the peroneus brevis alone was affected, we might spare the first, and divide the second only on the dorsal surface of the foot. I know that M. Duchenne (de Boulogne) has recommended this modification for those cases which he attributes to the impotence of the peroneus longus. Thus far I have met with no cases of this kind. If I should meet with any I should not hesitate to divide the peroneus brevis alone.