

When she attempts to walk without the instrument, the weight of her body is supported on the extreme posterior part of



FIG. 14.

the os calcis. The foot could very readily be brought to its natural position, in which place it was held during the application of



FIG. 15.

the galvanic current, which was continued for half a minute or a minute. After the action of the battery one-eightieth of a grain of strychnine was injected into the gastrocnemius, and the shoe with the elastic force applied as before.

The battery was applied in this way from half a minute to a minute at a time each day, for six weeks, before any perceptible contractions of the muscles could be observed. The injections of strychnine were repeated every eight or ten days for some three months.

The improvement for the first six months was very slight indeed, but still noticeable, and the time occupied in the application of the battery was increased to three or five minutes as the muscles became stronger; but, even then, it was observed that after a few vigorous contractions the muscles would refuse to respond to the same power of the battery.

May, 1870.—Very much improved; begins to have voluntary power over the muscles.

November, 1870.—Can make a forcible, voluntary contraction.

May, 1872.—Can extend the foot almost to the normal position when sitting down, but incapable of walking without artificial support.

The muscles of the calf of the leg have increased very much in size, but exact measurements were neglected to be taken. She still continues to use the shoe with elastic gastrocnemius, as seen in Fig. 14.

LECTURE VI.

DEFORMITIES.

Treatment (continued).—Manipulation.—*Massage.*—Dry Heat.—Baths.—Inunction.—Gymnastics.—Medicinal Agents.

GENTLEMEN: We will continue the study of the general principles which are to guide us in the treatment of deformities, and to-day I will first invite your attention to manipulation.

Manipulation may be regarded as the natural remedial agent for the cure of a deformity. In very many cases, so far as the

cure is concerned, the operation is the most insignificant part of the treatment. For example, in club-foot, tenotomy may be necessary; but, gentlemen, it is the subsequent manipulation of the foot that is, in a very great measure, to effect a permanent and complete cure.

Without manipulation, giving the foot a variety of passive movements, the result obtained by the operation, and fixing the foot in some immovable apparatus, is exactly what may be seen everywhere around us. Only a few months elapse before everything is as bad as it was previous to the operation, in consequence of the adhesions that have taken place. The importance of this principle we shall be able to demonstrate over and over again by cases which will be brought before you where its observance has been neglected.

Mechanical appliances are necessary, for the purpose of retaining deformed parts in certain positions after they have been placed in such positions by manual force; but the more frequently these mechanical appliances are removed, and the part subjected to manipulation, the greater will be the success that will attend your treatment of this class of deformities. While using any mechanical apparatus if manipulation be neglected, your patient will be deprived of that stimulus, motion, which is so essential for the perfect preservation of the usefulness of the deformed parts.

There is a case in my mind at the present time, which was one of the most melancholy I have ever seen. The case is worthy of recital. It was one in which there was fully-developed disease of the hip-joint. The lad lived at a long distance from the city, and the gentleman who performed the operation of tenotomy did it in a skillful manner. The limbs were dressed in the ordinary "wire-breeches," and the physician who had the case in charge was instructed with the greatest care concerning the necessity of frequently removing the dressing, performing slight manipulations, and then replacing it. The case had been, for three or four years, one in which the patient had suffered the most intense agony, and had slept only under the influence of large doses of anodynes. As soon, however, as the patient was placed in the immovable apparatus, and properly extended, he was so perfectly comfortable and easy, and slept so well at night, that the doctor who had him in charge thought it unnecessary to

remove it, fearing he might not be able to replace it, and make him as comfortable as he then was and had been since the apparatus was applied. He was, therefore, permitted to remain in the "wire-breeches" for nine months, simply because he was so free from pain. The result was that the disease was cured; but Nature had, unfortunately, cured it by ankylosing not only the hip-joint, which had been the seat of disease, but the hip-joint upon the opposite side, as well as both knee-joints and both ankle-joints. In five joints, in which there was not a trace of disease previous to the operation, ankylosis had taken place within nine months, without any inflammatory action at all; and simply because the doctor had neglected removing the fixed apparatus occasionally, and subjecting the parts to manipulation and movement. In making the frequent changes, therefore, in your apparatus, do not forget the manipulations, and also make the several movements which are natural to the joints.

There can be no substitute for manipulation by the human hand. There is an intelligent touch that admonishes you of the amount of resistance present, the amount of force required to overcome it, and when you should stop its exercise. You are able by this means to determine whether you are producing spasmodic contractions and consequent irritation, and you can arrest your force at any desired point. Under this head may also be embraced all that is understood by the fanciful term *massage*.

The principle is excellent, but the name is *quackish*. The term simply means friction or shampooing applied to muscles to assist in restoring lost vitality. All such movements are exceedingly beneficial, and very much increase nutrition by stimulating an increased blood-supply to the parts; the friction and kneading stimulate the absorbents in the removal of abnormal deposits. All such manipulations, however, of whatever name or nature, should not be continued so long, or used with so much force, as to excite inflammation, reflex contraction, or over-fatigue. Notwithstanding their great service and importance, an excess of them may produce irreparable injury.

Dry Heat.—Much benefit may be derived from the use of this agent. It is especially adapted to the treatment of paralytic deformities, and is beneficial from the fact that it solicits more blood to the part to which it is applied. It may be applied by means of any apparatus which the ingenuity of the patient or sur-

geon may devise. A very convenient method is by means of ordinary clay tubing. This means has lately been suggested by Dr. G. M. Beard, of this city. Clay tubes may be cast of any shape desired, heated to any degree bearable, and then the limbs may be placed within them.

Baths.—The bath is another item of general treatment, the value of which can hardly be over-estimated. The temperature is to be varied according to the constitution of the patient and the character of the deformity. In the treatment of paralytic deformities the bath is one of the most useful adjuvants to other treatment that can be employed. In such affections it should always be warm, and should be continued for a long time. Instead of being applied to the whole body, it should be applied to the part affected. In such cases the object of the bath is to increase the circulation of blood through the paralyzed parts for the purpose of increasing their nutrition.

You all know very well that, if you place your finger in a vessel of hot water, it will increase in size by increasing the quantity of blood, sufficient to prevent the removal of your ring from it. If, now, you plunge the same finger thus swollen into a vessel containing ice-water, contraction will follow and diminish the quantity of blood in the finger, and it may be sufficient to permit the ring to fall off. In the same manner the quantity of blood circulating in a paralyzed limb can be materially increased by means of the localized warm bath, the other parts of the body being cold, and in this way constitutes an important adjunct in the treatment of paralytic deformities.

Inunction.—You also have inunction as a means of general treatment. Upon this point I have but very little to say, for I am not very fond of grease. Oil—particularly petroleum—may be of benefit; as a general rule, however, all greasy substances are of but little value in this connection. The common people all have great faith in ointments, liniments, and various kinds of oil for the cure of paralyzed limbs, contracted tendons, etc. They are, therefore, constantly recommending for use skunk's-grease, chicken's-teeth grease, and many other specific greases; but my belief is that the chief, and I may say the sole benefit arising from their employment, is due to the "elbow-grease, or palm-oil," which necessarily accompanies their use, and not to any virtue possessed by the grease employed, unless it be that the small

quantity of phosphorus sometimes found in the combination may be a source of benefit.

A new article called *cosmoline* can now be obtained, which possesses most remarkable lubricating properties. This article is serviceable, from the fact that in very small quantities it lubricates the parts to such an extent, that friction may be kept up for a long time without producing undue irritation.

Gymnastics.—These are of great service in the treatment of deformities, but they must be used with much caution and under wise supervision. The muscles should be made to perform an exceedingly small amount of labor at first, lest over-fatigue be produced. It must be constantly kept in mind that, in all these deformed members, there are feebleness of circulation and impoverished muscular fibre, especially in the paralytic varieties. Consequently, a very small amount of movement may sometimes be very severe work for such muscles.

These exercises should be regular, systematic, and progressive, if you would derive the greatest possible advantage from their use.

Medicinal Agents.—There is a constitutional treatment which may be serviceable in many cases of disease which we shall have occasion to consider; but I feel warranted in warning you at the very outset that constitutional treatment, in the ordinary acceptation of that term, does not justly, in the vast majority of cases, occupy that prominent position which has hitherto been assigned to it. It will be seen hereafter, that many of those cases which have heretofore been regarded as the local manifestations of a constitutional cachexia are of purely local origin; and, instead of requiring a prolonged course of general treatment to remove a constitutional cause, they require a local treatment to remove a localized source of irritation, and through this the constitutional disturbance. Such treatment, when instituted, will permit the natural powers of the system in a great measure to restore themselves.

The constitutional treatment which is usually most beneficial is that embraced in a general observance of the laws of health; such as giving the patient an abundance of fresh air, a nourishing and easily-digested diet, and only such medicinal remedies as may be necessary to maintain a normal performance of the secretory and excretory functions. With regard to special

remedies to be administered in special cases, these will be fully considered when we come to speak of the treatment of separate diseases. *Strychnia*, however, is a remedy so constantly employed in the treatment of paralyzed muscles, that a brief reference should here be made to its use. It should be administered in doses sufficient only to produce slight twitchings of the muscle. The administration of $\frac{1}{60}$ -grain doses three times a day, and the subcutaneous injection of one-sixtieth of a grain into the muscle, once in eight or ten days, will ordinarily be sufficient to produce the desired results, and will also, as a rule, be of much service. Over-fatigue of muscles can be brought about by exciting undue contractions with this remedy, as well as by the application of electricity, or by excessive manipulation. Such fatigue is to be carefully avoided.

Thus, gentlemen, I have given you a general outline of our subject. I have endeavored to lay before you the reasons why you should make it a special study; I have directed your attention to the different varieties of deformities you will meet with, and have mentioned the general principles which are to govern you in their treatment. And I have, also, in a general way directed your attention to the operative treatment, and the mechanical appliances, etc., which are to be used subsequent to the operation. Repetitions of what has already been said will constantly be made throughout the entire course, and for so doing I have no apology to make, but on the contrary shall hope thereby to indelibly impress the principles which I teach upon your minds. We are now ready to commence the study of special deformities, and at my next lecture we will begin the study of *talipes*.

LECTURE VII.

TALIPES.

Definition.—Varieties and Combinations.—Mechanical Construction of the Normal Human Foot.—*Talipes Equinus*.—*Talipes Calcaneus*.—Case of Division of Tendo-Achilles by an Accident.—Mechanical Treatment of *Talipes Calcaneus*.

GENTLEMEN: To-day we commence the study of special deformities; and that which will first engage our attention is commonly known by the name of *club-foot*. The technical name for this class of deformities (for there are several varieties) is *talipes*.

Under the term TALIPES are included all deformities in which there is a permanent deviation from the normal relations of the foot to the leg, or of the parts composing the arch of the foot to each other, whether this deviation consists in flexion, extension, inversion, or eversion. *Talipes* is usually described under four distinct heads, namely, *talipes equinus*, *talipes calcaneus*, *talipes varus*, and *talipes valgus*.

Typical examples of any of these varieties are rare, for, nearly always the deformity is a combination of two varieties. For example, equinus may be combined with varus or valgus, and the same is true of calcaneus.

When we wish to designate such a deformity, the names of the two component distortions are combined, the more important always being placed first. Thus when we have a combination of equinus and varus, it is styled equino-varus or varo-equinus, according as the equinus or varus is the more prominent, and the same principle of nomenclature is used for calcaneo-varus and valgus.

In addition to the above-mentioned varieties, there is one known as *talipes cavus* or *plantaris*. This is a very frequent complication of other varieties of *talipes*. When it is present as a complication, it does not, as a rule, enter the name of the deformity. When, however, as occasionally happens, the case presents no other deformity than that caused by the contraction of the plantar fascia, the name *talipes cavus* or *plantaris* is used. The deformity known as *flat-foot*, I think, should be considered as a variety of valgus, as the peculiar breaking down of