

ly adjusted, she runs with perfect freedom, and without the slightest limp.

October 31, 1868.—A slight inversion of the toe remains.



FIG. 55.



FIG. 56.

Ordered a ball-and-socket shoe in order that the eversion muscle may be applied. This corrects the inversion perfectly.

CASE. *Talipes Plantaris, Section of Plantar Fascia, Flexors, and subsequently the Integuments; Elastic Extension; Cure.*—Miss N., of Georgia, aged twelve, gives the following history: When sixteen months old she had an attack of convulsions, and another four months later. Soon after, the left foot was noticed to be contracted; or, as the mother expresses it, "she was pigeon-toed when her weight came upon the foot." For a short time she wore some sort of a club-foot shoe, but soon abandoned it. No treatment beyond liniments was employed, until October, 1865, when, in accordance with the advice of several surgeons, the tendo-Achillis was cut, and the treatment continued by applying a very stiff club-foot shoe. No material benefit followed the operation. The deformity increased, till, in the winter of 1867-'68, it was so far advanced that, in walking, the toe alone touched the ground. In May, 1868, the tendon of the extensor proprius pollicis was cut, with the expectation of relieving the deformity. This hope was not realized, the difficulty in walking being greater than ever. The parents accordingly brought the child to this city, to Prof. W. H. Van Buren, who sent the case to me.

July 29, 1868.—The position of the foot, when no weight is

upon it, is as in Fig. 57; when, however, the child attempts to walk, the position becomes as in Fig. 58. The great-toe is semi-luxated by the pressure falling directly upon the ball of it.

Under chloroform I cut the plantar fascia and short flexors of the foot, and fastened the foot to a board. The patient went out



FIG. 57.



FIG. 58.

of town for a few days, and the foot was not properly attended to. The wound did not unite by first intention, but a slight amount of suppuration followed.

August 17th.—The foot still resisted attempts at straightening. I accordingly divided the integuments in the sole of the foot, forcibly pressed the tarsal bones into proper position with the hand, and broke up the adhesions in the sole of the foot. The foot was then firmly bandaged to a board with a large compress of wool over the instep. The operation was followed by some febrile reaction, which had disappeared on the following day.

September 1, 1868.—The progress has been uninterrupted since the last operation; though the wound in the sole is not entirely healed, she is able to have the shoe with the jointed sole applied, and to walk in it without pain, the heel being down and the foot in a natural position. Since the operation the foot is about one and a half inch longer than before.

17th.—Recovery perfect. She everts and flexes the foot voluntarily. In walking, she wears an ordinary laced boot, with

a single rubber muscle from opposite the little toe to one of the upper eyelet-holes. (See Fig. 59, from a photograph).



FIG. 59.

CASE. *Talipes Plantaris, or Cavus, Traumatica, with Dislocation of Tarsal Bones, of Eighteen Years' Standing; Operation; Treatment by Elastic Extension; Cure.*—September 1, 1868.—Miss F., aged twenty-five, New York City. When about seven years old she injured her right foot by jumping from the seat of a high wagon to the ground. The injury was sufficient to cause severe pain for a time. After the disappearance of the pain the foot was neglected for two or three years, but, after the lapse of this time, surgical care was demanded. The physician in attendance cut the tendo-Achillis. He proposed section of the plantar fascia, but, for some reason, it was not made. From that time she was able to walk tolerably well until between three and four years ago, when, she having adopted a sedentary occupation, the foot became painful in walking, and the ankle, which had always been weak, frequently turned under her weight. She attributes this change to a failure of strength from confinement in-doors, rather than to a progressive contraction of the foot.

The sound foot is eight inches in length, the diseased one is so shortened (see Fig. 60), by the contraction of the sole and elevation of the toes, that but five inches rest upon the ground. The calf of the sound side is twelve and a quarter inches in circumference, that on the injured side ten and a half inches. The limbs are of the same length.

After anæsthetizing the patient, the deformity was reduced

by cutting the plantar fascia and then forcing the projecting bone as a wedge down between the adjoining bones. To accomplish this, very considerable force was required. The wound of the skin in the sole was tightly closed, as described above when



FIG. 60.

speaking of tenotomy. The foot was secured in proper position by bandaging it strongly to a board padded with cotton. The foot was now seven inches on the ground, instead of five. Dr. J. C. Nott assisted me in this operation.

September 12th.—Applied ball-and-socket shoe, lacing in front, and with a slight heel.

20th.—The patient having returned to her work, the foot has



FIG. 61.

troubled her considerably, owing to tenderness over the tarsus. The force required to reduce the bones to proper position appears to have caused a slight periostitis, which is reëxcited by

any attempt at walking. Rest for a week, with cold and sedative lotions, were accordingly directed. The result was perfectly satisfactory. Ordered to manipulate the foot with the hand.

January 1, 1869.—The foot has improved so much that the club-foot shoe is no longer necessary, an ordinary, neat-fitting, laced boot sufficing to keep the foot in its normal position. Fig. 61 shows the condition of the foot.

CASE. *Talipes Varus Paralytica, acquired, of Five Years' Standing; Unsuccessful Treatment by Tenotomy; Subsequent Treatment by Elastic Extension successful.*—September 9, 1868.—Harry M., aged seven, New York City. Until two years of age was perfectly well. At that time he suffered from a severe diarrhoea, and during the course of the disease was suddenly seized with paralysis of both upper and lower extremities. After about two months he recovered the use of his arms and of his left leg. The peroneal muscles of the right leg remained paralyzed, and are still so, a marked talipes varus being the result.

In 1865 the family physician cut the tendo-Achillis, the tendon of the tibialis-anticus, and the plantar fascia, and applied a fixed club-foot shoe, which allowed no motion to the foot. The result



FIG. 62.

FIG. 63.

was negative. The condition of the foot at the present time is shown in Fig. 62.

I applied the ball-and-socket club-foot shoe, with rubber muscles, for flexion on the fibular side of the leg, and for eversion of the foot. Figs. 62, 63, and 64, are from photographs taken

at the same visit to the photographer's. Fig. 62 exhibits the deformity. Fig. 63 shows the shoe adapted to the foot (not the foot to the shoe), and Fig. 64 the restoration of the foot to its normal condition, after the rubber muscles were attached.

In addition to wearing the shoe, frictions and electricity have been applied to the leg.

January 9, 1869.—The progress toward cure has been steady. The calf of the paralyzed leg has increased about an inch in cir-



FIG. 64.



FIG. 65.

cumference since the commencement of treatment. The power over the muscles has increased, so that he can voluntarily flex the foot, although he is still unable to evert it.

January 22d.—The condition of the case is shown in Fig. 65, from photograph by O'Neil.

CASE. *Congenital Double Talipes Varo-Equinus; Tenotomy; Reduction of Dislocated Tarsal Bones by Force.*—Herbert F. C., aged ten, Massachusetts. The mother thinks the deformity due to the fact that, about the second month of pregnancy, she sat in a cramped position for some hours, and, from that time till the birth of the child, was impressed with the idea that the child would have deformed feet. When eighteen months old he was placed under treatment. Since that time he has worn constantly orthopedic shoes of one sort or another. They have, however, always been stiff and fixed. At present the deformity is so great that he can with difficulty stand alone without artificial support. Calves, nine inches and seven and a quarter

inches. His gait is very labored and clumsy. The plantar fasciæ and the short flexors of the feet are tender when put on the stretch, as also are the tendons of the solei muscles. The head of the astragalus and anterior extremity of the calcaneum are protruded to a remarkable extent (see Fig. 66, from photograph.)



FIG. 66.

November 16, 1868.—Before the class at Bellevue Hospital, anesthetized the patient, cut the tendons-Achillis, plantar fasciæ, and the short flexors. By exerting great force upon the tarsal bones with the hands, they were forced down into their proper



FIG. 67.

places. The soles of the feet were fixed to boards and the feet properly padded and very firmly bandaged.

December 9, 1868.—There has been no disagreeable result from

the force employed. The boy walks very well with the ball-and-socket shoe. The feet are very nearly in normal position.

Fig. 67 shows the change which had taken place, January 20, 1869, from photograph by Mason.

CASE. *Double Talipes Varus, congenital; treated by Neil's Plan, later by Adhesive Plaster, and by Barwell's Method.*—November 5, 1868.—A. J. K., aged three weeks, New York City. Has double congenital talipes varus. The position of the feet is as in Fig. 68. Applied the dressing of Dr. Henry Neil (Fig. 40).

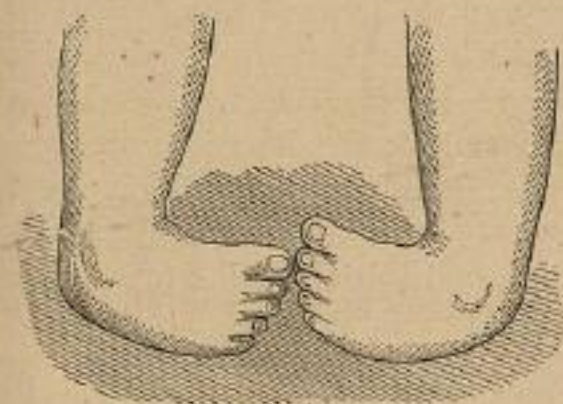


FIG. 68.

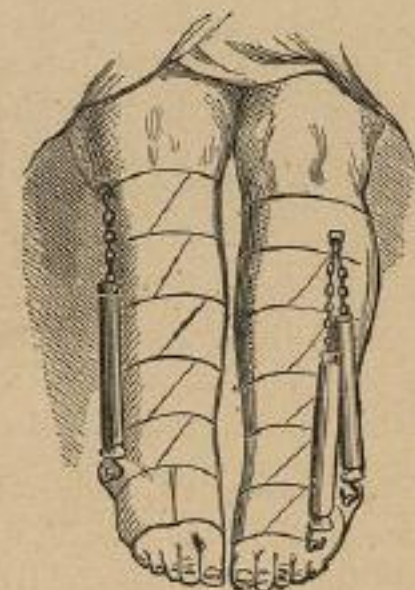


FIG. 69.

November 10th.—The treatment has straightened the feet considerably, but the child has cried so much that the mother removed the dressing. Accordingly, November 14th, the adhesive-plaster dressing (Fig. 43) was applied. This was worn for two or three weeks, when it became loosened. The mother neglected to come to the office again, and the child went without treatment for several weeks.

January 9, 1869.—Applied Barwell's dressing.

19th.—Result was very satisfactory. Position as in Fig. 69. The inner edges of the two feet can be placed in apposition from heel to toe.

The following case of acquired talipes, the result of spinal meningitis, is of some interest, as illustrating the existence in the same patient of the most intense hyperæsthesia of the cutaneous surface and perfect or complete motor paralysis at the same time:

CASE.—Miss Hattie B., aged twenty-two. Was always robust and very active until December, 1868, when, in Stuttgart, Germany, she contracted typhoid fever during an epidemic. Can get but little account of this illness, save that it lasted many weeks, during much of which time the patient was in a state of low delirium, and later she was too weak to take much notice of occurring events. When she first recollected herself after the fever, all power over her limbs was gone. She could not even move a single toe on either foot, and could not lift a fork or spoon from the table. She had extensive bed-sores on the heels, over the sacrum and trochanters.

At this time the cutaneous surface of the whole body was so exceedingly sensitive as to cause her great agony when touched or rubbed, even in the lightest manner.

In August, 1869, her mother went to her, and found her suffering chiefly from the trouble which still in part remains, viz., contractions of the lower limbs with hyperæsthesia. Her knees at that time were very rigidly extended; the lower limbs, especially the feet, were excessively sensitive, the weight of a sheet being too much for her to bear.

The feet after washing could not be dried with a towel, raw cotton being used instead, and even this would cause an involuntary shudder as it touched the skin. Under the treatment at Stuttgart, the knees partly regained their mobility, the hyperæsthesia diminished, and the position of the feet was somewhat improved.

After her return to this country, Dr. Barber, of Leroy, New York, practised manipulations of the feet with the hope of diminishing the distortion, which is that of talipes equino-varus, with a strong curve on the edge of the plantar fascia.

Dr. Barber improved the position of her feet somewhat, but, not being satisfied with the progress of the case, sent her to me in July, 1870.

The manipulations were continued for some weeks, but the sensibility was too great to allow of the exertion of much force; in fact, you could scarcely touch the feet, or rub the skin in the lightest manner possible, without causing her to scream with agony. The deformity could not be rectified, even under full anaesthesia.

September 30, 1870.—The position of her feet is as seen

in Fig. 70, from drawings by Dr. L. M. Yale, made at the time.

She was placed fully under chloroform, and I divided the tendo-Achillis and plantar fascia of the left foot, and was then

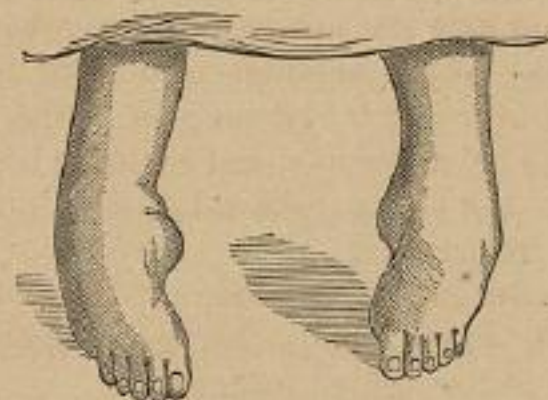


FIG. 70.

compelled to divide the skin also before I could restore it to position. The foot was then dressed with adhesive plaster and a board (see Fig. 43). When the effects of the chloroform had passed off, she complained of great agony, although a full dose of Magendie's solution had been given at 4 P. M. At 6 P. M. repeated the morphine. This being the first and only case where continued pain has followed the operation, I have reported the daily notes of the case as taken at the time by Dr. Yale:

October 1st.—Continues to complain greatly; has not slept; gave bromide of potassium without effect.

2d.—Some relief, due probably to the foot having slipped in the dressing. Fifteen-grain doses of hydrate of chloral seemed to produce better effect than morphine, to which latter she had become accustomed during her last illness. After her return to this country, she had great difficulty in breaking up the habit.

4th.—Dressed foot. At base of little toe an ecchymosed spot looking likely to slough. Lessened the strain of the adhesive plaster.

6th.—Dressing very inconvenient; a simple side-strap substituted. Begins to have some appetite, but has constant chilly sensations.

10th.—Has been sitting up for past few days. Could bear pressure on foot much better. Allowed wound in sole to close. The tendo-Achillis wound has also united.

11th.—Had last evening, at 10 P. M., a severe chill, lasting an hour and a half, followed by fever and delirium; attempted to get out of bed. Delirium continued through the day; pulse 120, respiration 43. No signs of pneumonia, or any internal inflammation. Gave spiritus Mindereri and spirits of nitre; liquor potassæ arsenitis. Foot looks all right; no sign of trouble except the bruised spot under little toe, from pressure of the board.

12th, 9 A. M.—Pulse 120, respiration 29. Erysipelatous blush running up left leg, and the back and inside of left thigh. Opened wound; found no confined pus; lips had granulated under the scab. Poultice to foot.

P. M.—Met Dr. Clymer in consultation. Pulse 118, respiration 29. Temperature under right thigh,  $103\frac{4}{100}^{\circ}$ ; under left (erysipelatous),  $104^{\circ}$ . To take hourly one grain of sulphate of quinine; one-half drop Fowler's solution; nitras argenti locally. Food, every two hours, milk and broth.

The fever continued until October 28th. The highest temperature (under sound thigh) was  $103^{\circ}.8$ . Remissions below  $100^{\circ}$  occurred 12th P. M., 16th A. M., 19th A. M., 23d A. M., 24th P. M., 28th P. M. On the 17th the erysipelas became migratory in character, and diminished in severity. The ecchymosed spot on the little toe was opened on the 15th, and discharged a little pus,



FIG. 71.

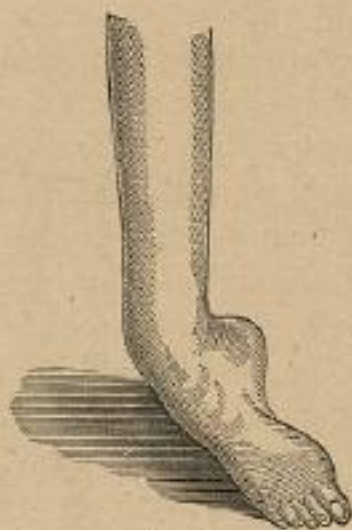


FIG. 72.

from which time she began to recover. On the 23d there was an eruption of sudamina; on the 24th, over back; and notes an

eruption, very much resembling scarlatina, absent from the anterior surface of the body. This lasted until the 29th. From this time she convalesced slowly, and, after some time, the manipulations of the foot were again resumed, and resulted, in about six months, in producing a very useful and nearly normal foot, as seen in Fig. 71.

The operation had been attended with so much danger, that I refused to operate upon the other foot until her general health could be improved. She, therefore, left the city for Leroy, New York, where she remained for two years, getting around on her crutches, and bearing her entire weight on the "Sayre" foot (as she called it) without any pain; but the other foot was entirely useless, and very painful on the slightest pressure.

She returned in May, 1873, much improved in general health, with her left foot as seen in Fig. 71, and the right one as seen in Fig. 72.

May 19, 1873, she was put under chloroform by Dr. Yale, and I divided the tendo-Achillis, and cut the plantar fascia, and dressed the foot with the board and adhesive plaster (see Fig. 43), with an additional plaster around the foot, and drawn firmly upon the outside of the leg. An injection of morphine was administered hypodermically. In the evening the patient was very comfortable, and declined taking any more morphine, on account of the difficulty she had formerly experienced in breaking up the habit.

June 18th.—Dressing was removed; had been on twelve

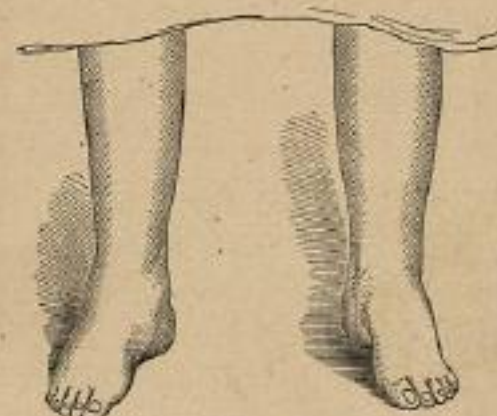


FIG. 73.

days; all the wounds entirely healed, without pus. The instep was a little bruised, but no slough. The foot very much improved

in position; heel comes down to the floor without pain. She is able to flex the foot voluntarily. There is some inversion of the foot, which is retained in position by adhesive straps.

24th.—Much improved; she is able to walk a little by the aid of a chair.

From this time she improved rapidly; was able to have her feet shampooed and rubbed freely without pain, and on July 1, 1873, was able to walk in an ordinary shoe. The feet are both shorter than natural, and thicker at the ball, on account of the contraction of the toes; but she is able to walk without assistance, with both feet naturally upon the floor, as seen in Fig. 73.

The following case shows what can be done to rectify the deformities of the part by very simple means, if applied at an early age:

CASE.—A son of J. H. B., aged seven months, 16 East Third Street, was sent to me by Dr. J. P. Lynch, February 1, 1870, with congenital talipes varus of the left foot. (See Fig. 74.)



FIG. 74.

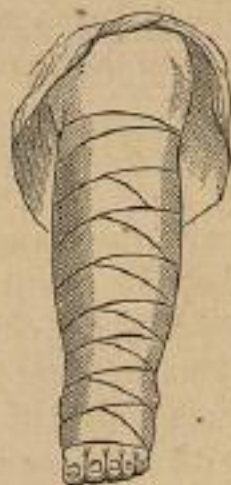


FIG. 75.

After manipulating the foot for about one hour, as already described, the foot was dressed with adhesive plaster and a roller, and retained in its natural position without any difficulty. (See Fig. 75.) Both from drawings by Dr. L. M. Yale, and both drawings made within two hours of each other.

These dressings were changed from time to time as occasion required, and, when the child was old enough to walk, a slight rubber elastic from the outer toe of the shoe to the garter was all that was required to guide the foot to its normal position. Gal-

vanism, friction, and shampooing, were continued until the child was two years old, when the cure was complete, and remains so. (See Fig. 76.)



FIG. 76.

The following case shows what can sometimes be done, even in the worst form of talipes, by intelligent and persevering effort, without tenotomy, although the treatment was carried out entirely by the father (a non-professional man) after only two practical lessons as to the principles involved in the treatment of paralytic cases:

CASE.—Harry B., aged one year, was sent to me on December 29, 1869, by Dr. G. W. Hodgson, of White Plains, New York, with the statement that he had been under treatment in an orthopedic institution in this city, by his advice, since he was eleven weeks old; but, finding no improvement, he had advised them to bring the child to me. He had been wearing club-foot shoes with stiff soles and an iron brace up the legs all the time, with no other result than producing a number of callosities on the feet, which were quite sore and inflamed. In consequence of the pain inflicted by the shoes, they could only be worn a very short time, and had to be removed several times a day.

As soon as the shoes were removed, and the child made to stand, the feet assumed the position as seen in Figs. 77 and 78, from photographs by O'Neil, December 29, 1869.

After manipulating the feet a short time, I found that they could be brought very nearly into their normal position without tenotomy, and, finding them to be of paralytic origin, I therefore dressed them after "Barwell's method," as previously described.

In referring to my case-book, I find the following, and the

only entry in connection with this case: "*February 1, 1870.*—Redressed; progressing favorably." From this time I lost sight of the case entirely, and never saw him until June 21, 1873, when his feet were almost perfect, as will be seen in Fig. 79, from a

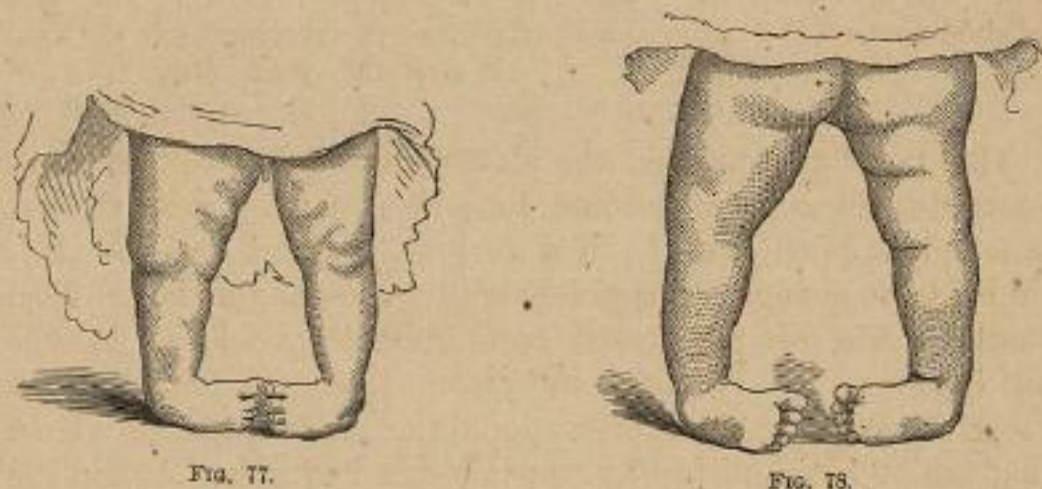


FIG. 77.

FIG. 78.

photograph sent to me by the father with the following letter in answer to one from Dr. Hodgson inquiring as to the result of treatment in the case.

At the second visit, February 1, 1870, the father stated that



FIG. 79.

he had already spent so much money on the child that he could not afford to go on with the treatment, and I therefore took great pains to instruct him as to the application of the plaster and "rubber muscles," and also the proper manipulations to be given to the feet, and trusted to his ability to carry on the treatment.

The result is seen in Fig. 79, from a photograph sent by the father, with the following letter, dated

"AMENIA, DUTCHESS COUNTY, June 10, 1873.

"DR. L. A. SATEE—

"DEAR SIR: I send you a photograph of Harry's feet, and am so proud to think you have asked for one!

"Little did I think they would ever be made so perfect! I have done just as you told me to do from the first, and have worked night and day to do it. You have acted like a father to the little fellow, and, by your skill and good treatment, they are about perfect, except a little crook in the toe.

"Gratefully yours, etc.,

"B. T. B."

Had the father applied the plaster nearer the toe, the small deformity still remaining could have been easily corrected; but he simply applied it as he had seen me do it on the first visit, and made no change in his points of attachment for the artificial muscles as the cure progressed, as he should have done. As the case illustrates a very important practical point, I have thought it worth recording, to impress upon the student and physician what can be accomplished by constant care and attention, and the application of a continuous elastic force properly applied.

The following case, though not so great a deformity, illustrates the same principle of treatment, and the success that can be obtained by the constant care of non-professional attendants, if they are only properly instructed:

CASE.—Catherine M., Susquehanna, Pennsylvania, aged seven-

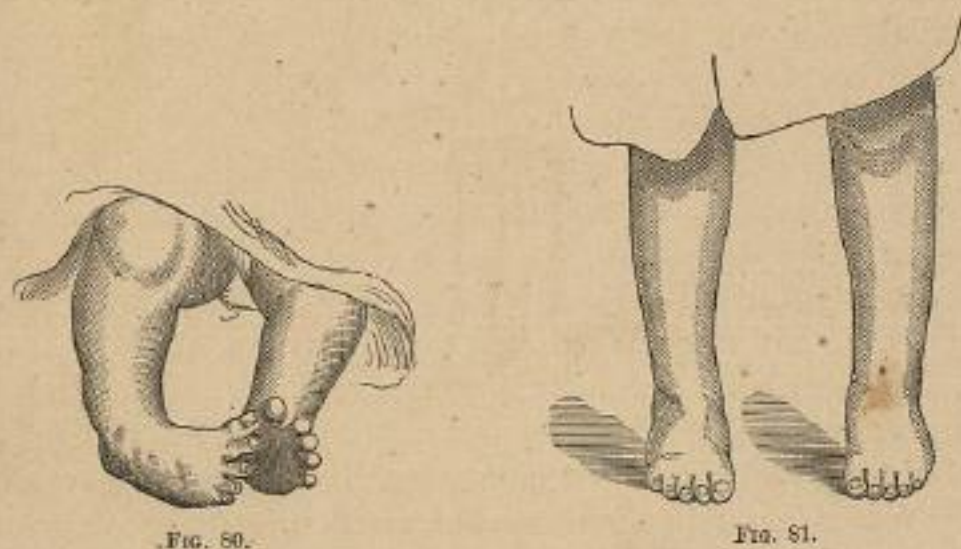


FIG. 80.

FIG. 81.

teen days, was brought to my clinic at Bellevue Hospital in September, 1870, with congenital talipes equino-varus of both feet, of paralytic origin, as seen in Fig. 80, from photograph taken at the time by Mason, photographer to Bellevue Hospital.



After manipulating the feet a short time, and being satisfied that the deformity was of paralytic origin, I dressed them with Neil's foot-board, in order to show the class its mode of application. (See Fig. 40.)

This was used some three weeks, without any marked improvement, and "Barwell's" dressing, with India-rubber muscles, was substituted in its place, and the mother returned with the child to her home in Pennsylvania.

The mother took entire charge of the case from this time, changing the plasters as occasion required, and moving their position according to instructions as the child's feet became more straight. The plaster and rubber muscles were worn until the child was able to walk, when she applied my improved club-foot shoe, which she wore until the spring of 1873, when she was perfectly cured, as seen in Fig. 81, from photograph by O'Neil, taken March 21, 1873.

In looking over my note-book, I find a number of cases very similar to the last two here described, and that have terminated with the same fortunate result, by following the treatment above recommended; and I can, therefore, speak of it with confidence.

It frequently happens, in bad cases of varus and varo-equinus, that after we have restored the foot to its normal shape, either by the constant use of elastic tension, or by tenotomy of the tendo-Achillis and plantar fascia combined with elastic tension, as the case may be, that the foot, although perfect in shape, cannot be held in the proper position, but will remain inverted on account of the paralysis of the rotator muscles of the thigh; and, to overcome this deformity, it becomes necessary to evert or rotate outward the entire limb.

To accomplish this object, Mr. Reynders, 309 Fourth Avenue, New York, has recently constructed for me a shoe with the additional attachment of a rotating screw, which fulfills the indications most completely. It is the application of the same principle which I have for so long a time used in the outward rotation of the femur in the third stage of hip-disease.

In applying this force for the outward rotation of the foot, in cases of club-feet, a light metallic rod, or shaft, is secured to the bottom of the shoe, in front of the heel, passes up on the outer side of the limb, and connects with a well-padded pelvis-belt, *A*, having joints, of course, opposite the ankle, *H*, knee, *E*, and hip, *B*.

Just below the joint, opposite the hip, the shaft is divided into two sections, and at this point is an endless screw, *C*, placed transversely to the shaft. The screw is worked by a key, *C*, and is capable of producing rotation through two-thirds of the arc of a circle. *R*, is a well-padded belt, just above the ankle, and *D*, another belt above the knee. (See Fig. 82.)

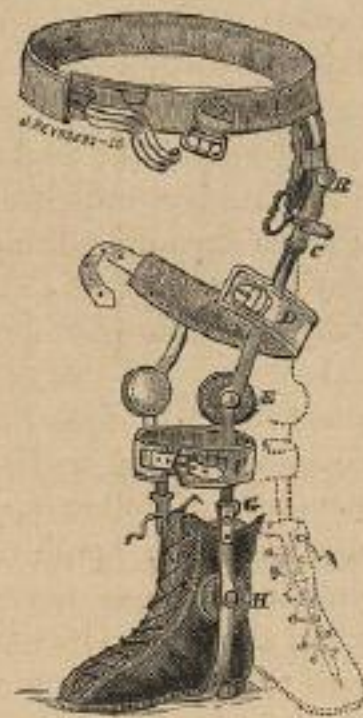


FIG. 82.

The following case, for which the instrument was constructed, illustrates not only this point, but also another, which it seems important to bring more prominently forward, namely, the importance of commencing the treatment of this class of deformities immediately after birth, as it will be seen that the position of one of the feet was perfectly rectified in a very short time, by simply placing it in the natural position, and using proper dressings. The other foot, which had undergone structural shortening, required section of the contracted tendons and fasciæ before perfect restoration could be effected.

CASE. *Congenital Varo-Equinus, Left Foot; Varo-Calcanæus, Right Foot* (as seen in annexed Drawing, by Dr. YALE, Fig. 83).—January 2, 1874, I was called, at the request of Prof. Barker, to see the infant child of Mr. B., Eighteenth Street, aged four days.

By manipulating his feet for half an hour or more, I was

enabled to bring the right into its natural position, and the left one nearly so, without much trouble, and to retain them in this position, with the circulation restored.

During the first efforts at restoration of the feet to their natural position, they would become ashy white, but the color



FIG. 83.

would instantly return on letting them go back to their original distortion.

The *left* foot was retained as nearly in its normal position as it could be brought by a single piece of adhesive plaster around the foot, drawn up on the outside of the leg and secured by a flannel roller.

The *right* foot had a piece of adhesive plaster placed on the plantar surface—drawing the heel up, and secured on the back of the leg; and another strip of plaster, to correct the varus, same as the left, and both secured by a flannel roller. No anæsthetic; no crying; no cutting.

*January 4th.*—Child very comfortable. Renewed dressings, with friction.

*6th.*—Child perfectly easy, and feet improved in position. Readjusted dressings.

*February 3d.*—Dressings reapplied (same plaster being used) every two days until February 1st, when the dressings were entirely removed from the right foot, which was perfectly cured, the child voluntarily retaining it in its natural position; but the left foot gave reflex spasm on point-pressure upon the tendo-Achillis and plantar fascia. However, on account of the removal of the child to the country, these tissues were not divided, but elastic tension was advised to be continued, in hope of benefiting

the child, and with the intention of cutting in the future, if found to be necessary; and on—

*December 11, 1874,* finding that point-pressure upon the tendo-Achillis and plantar fascia, when stretched, produced reflex contractions, the same as when I saw the child nine months previous, and that no improvement had taken place during this time, although under the constant influence of an elastic tractile force, I decided that these tissues must be divided, as I had intimated would have to be done nine months before. I consequently cut the tendo-Achillis and plantar fascia of the left foot, and dressed with adhesive plaster and board, as seen in Fig. 43.

*27th.*—Result perfect, as far as form of foot is concerned; stands flat on the floor, but the foot is inverted, the whole limb being rotated inward. The child lacks the power of everting the foot or rotating the limb outward. It is easily rotated outward by the hand, and frequently, in stepping, the child will do it himself, but most of the time it remains inverted (as seen in Fig. 84); and, as he is too young to reason with, it is neces-



FIG. 84.



FIG. 85.

sary to contrive some plan to make the outward rotation constant; and for this purpose the shoe above described was applied, which answers the object perfectly, the child walking quite well. (See Fig. 85, from photograph by O'Neil.)

Where there is only one foot involved in this deformity, the application of this rotary force to the ordinary shoe will be found

of the greatest advantage; but, where both feet are implicated in the same deformity, a similar result to the above can be produced by a much simpler and more economical apparatus, although it is not quite so perfect in allowing free movements of all the parts, or so elegant in appearance. It will be found very useful for the poorer classes of patients.



FIG. 86.

It consists simply in securing the heels of a pair of common shoes together by an iron rod, with joints on each shoe, and the soles secured in the same way, with a rod a little longer than the one at the heel, in order to evert the feet. (See Fig. 86.) On either side of the shoes, iron bars, jointed at the ankles, pass up to near the top of the tibia, connecting in the rear with a padded iron belt, which buckles in front. The practical use of this apparatus is well illustrated in the following case:



FIG. 87.

CASE.—*Congenital Double Varo-Equinus* (as seen in annexed drawing by Dr. Yale).

January 8, 1872, I saw the infant child of J. W. P., of Brooklyn. Plaster dressings were applied.

October 5th.—Cut left tendo-Achillis at Bellevue College.

10th.—Heel comes down very well. There is a tense condition of the hollow of the foot, which appears to be contracted integument and condensed connective tissue only; at least the edge of the plantar fascia cannot be recognized.

19th.—Cut right tendo-Achillis at Bellevue College.

21st.—Dressed with adhesive strips alone, leaving off the foot-board. The wound has entirely healed.

December 29, 1874.—Both feet were perfectly restored in form and position, the child stepping flat on the ground, but both the feet and the limbs were very strongly rotated inward (as seen in Fig. 88); and, as the parents were too poor to purchase the instrument with the rotating screw, I advised the father,



FIG. 88.

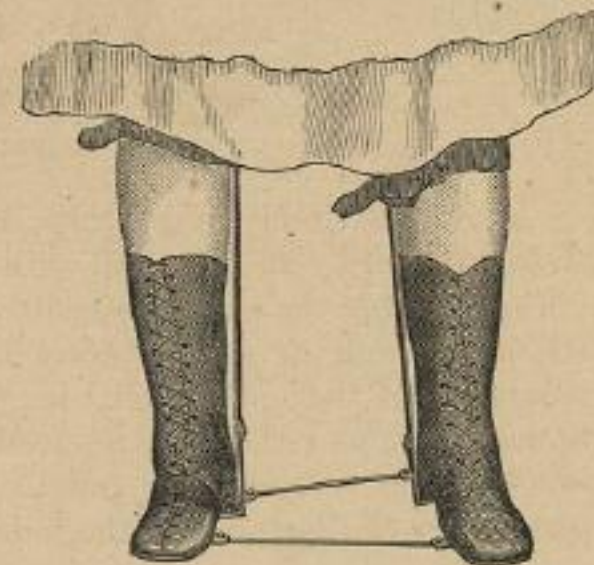


FIG. 89.

who was a locksmith, to construct a pair of shoes as above described, which, being put on the child, retained his feet in their normal position (as seen in Fig. 89).

With these shoes on, the child runs about with great activity, his steps merely being limited in length by the bars between his shoes, which compel each step to be made with an eversion of the toes in the natural direction. In all cases of double varus, with this tendency to inversion and inward rotation, in the poorer classes of patients, this simple contrivance will be found of the greatest practical utility.

The following case of extreme equinus—of a paralytic origin—is a beautiful illustration of how rapidly they sometimes recover, after being restored to proper position.

CASE. *Paralytic Equinus, with Resulting Contracture of Tendo-Achillis and Plantar Fascia.*—Emma H., 14 Cottage Place, aged twelve, was a perfectly healthy child, till she was upward of three years of age. She was then suddenly attacked with paralysis of the right upper extremity and left lower ex-



FIG. 90.

tremity. In the course of three or four months, the upper extremity recovered its power. The lower extremity (left) has partially recovered. It is still shorter and smaller than its fellow. The measurements are: Length, right, 29 inches; left, 28 inches. Circumference of thigh, right, 14 inches; left, 12 inches. Circumference of calf, right, 11 inches; left, 9 inches. The motions of the thigh are perfect, and under complete control. The left foot presents an extreme case of talipes equinus (*see* Fig. 90, from photograph by O'Neil). The plantar fascia and tendo-Achillis are tense, and very tender; point-pressure in each causes spasm. Owing to the distorted position of the foot, the astragalus projects markedly, as seen in the cut.

October 12, 1874.—Cut plantar fascia and tendo-Achillis, and dressed with foot-board and adhesive plaster. (*See* Fig. 43.)

Pressure over the astragalus, in order to reduce it, was very great, and may endanger sloughing.

Sloughing did occur, as feared, and also on the sole, beneath the heel and ball of the foot. These accidents necessitated pro-

longed dressings. The sores finally cicatrized completely. The present position and condition are shown in the accompanying figure (91), from photograph by O'Neil, which was taken just three months after the operation.

The foot is restored to almost perfect form; and the recovery



FIG. 91.

of muscular power to flex the foot has been more rapid than in any case of the same severity that I have ever seen; and it is for this reason that I have thought it worthy of being recorded.

With one more thickness of leather on the heel and sole of the left shoe, to equalize the length of the limbs, she walks without any limp, and has no deformity that can be discovered.