April 27 I commenced giving Fowler's solution as a general tonic. On April 29 I stopped the quinin. The patient was feeling somewhat better and more cheerful. On April 30 the neck measured $11\frac{1}{4}$ inches. The supraclavicular glands were much shrunken and becoming hard, nodular and more freely movable under the skin. Temperature was 100, pulse 100.

May 1 I stopped x-ray treatment, as there was some evidence of burning. On May 5, temperature was 98.4; pulse 100, this being the first time I found temperature normal in three months' observation. The x-ray burn was now very evident, being of oval shape, about 2 inches wide by 4 inches long, with desquamating surface. There was some burning and itching, with alopecia on that side of the head. She felt much better and had gained four pounds in weight. The glands felt much harder and more nodular, and were loosening from the deeper structures. The pains in the legs had disappeared, but the knees still felt very weak when she stood any length of time. All nervous symptoms, tremor, etc., have disappeared.

May 12 the x-ray dermatitis was fully developed, and the skin was sloughing in places. The area of alopecia was somewhat increased. She had a keener appetite. The weakness in the knees had disappeared and she gained 2 more pounds in weight. The bowels had become regular. The temperature was normal and the tongue clear.

May 28 the x-ray burn showed signs of healthy granulations, and on June 3 skin grafts from the thigh were applied to the denuded area under medullary narcosis, which proved to be a very efficient and convenient anesthetic.

June 6 all grafts had united and the inflammatory condition subsided.

July 24 the glands were still receding, and the neck measured 11 inches. The contour fairly matched that of the opposite side. She stated that she felt in the best of health, and her appearance fully bore out her assertion.

Apparatus and Technic.—The current I obtained from a 16-plate static machine driven by hand. I used a Gundlach tube, taking a 4-inch spark gap. The target of the tube was placed 18 inches from the patient, with one treatment of twenty minutes' duration each day for the time stated.

Comments.—As treatment progressed, the spleen increased in size. This phenomena was noted by Senn in *THE JOURNAL*, but I have not seen any mention of the distinct rise in temperature after each treatment, encountered in this case. The only explanation that I can offer is that there must have been certain toxic products, liberated through the influence of the x rays, which were at once taken up by the circulation, causing also the acute exacerbations of ill feeling following each exposure. This condition of elevated temperature and ill feeling lasted from ten to fourteen hours, and was so severe at times that we both thought of abandoning treatment had it not been for the steady reduction of the size of the glands.

Present Condition.—At the present time, Feb. 22, 1904, all the formerly enlarged glands have receded to their natural size, but still retain their hard fibrous condition. The patient is and continues in the best of health, no trace of the disease remaining.

I intend to keep her under observation for some time, as it is too early to report a permanent cure. The result obtained has been very satisfactory, especially since the outcome of this disease, under the use of other therapeutic agents, has been almost invariably fatal.

cessively dealt with. In older cases where an operation of some sort is necessary, the complete overcorrection is best made at once. To partially correct such a case by operation, trusting to apparatus or body weight to complete the rectification, is to invite disappointment. For the clubfoot is not simply a misshapen foot. It is a clubfoot by reason of a peculiar distorting force which is actively at work in it. This force, if not overcome, increases rapidly. It is stimulated by unbalanced muscular movements, by weight bearing and frequently by the very measures which are employed for the cure of the case. For inefficient or intermittent resistance toughens clubfeet just as exercise strengthens normal muscles, ligaments and bones, but to a greater degree. Abnormal relations between bones induce abnormal shapes and abnormal internal struc-

Fig. 1.—Pattern of footpiece. Dotted line shows outline of sole. The correction of a clubfoot must be prompt and rapid to overtake the increasing rigidity. It must be excessive and long maintained, because of the inevitable tendency to relapse.

For the correction of the equinus in young subjects where the lateral deviation, if any, has been overcome, and where no operation is necessary, and also as a retention splint where the resistance to overcorrection has been eliminated by operation or otherwise, I employ the simple instrument here presented. Any tinsmith can make it from pattern and measurements furnished by the surgeon. It can be bent laterally as well as anteroposteriorly, into any required shape. It covers only those parts where pressure is needed. It has no joints to wear

Figs. 2 and 3.—Retention splint off and on.

out. It is inexpensive. As compared with plaster of paris it has the following advantage: Being removable and capable of adjustment and modification, and the foot being accessible for examination, bathing, exercise and massage, one can apply more pressure than one would venture to use when the part is out of sight and reach. Rectification can therefore be more rapidly accomplished and nutrition is not so much interfered with.

The splint consists of a footpiece and calf band of galvanized iron or sheet brass, 22 gauge, and two side bars of telegraph wire, brass rod or Bessemer rod $3/16$ inch in diameter. These dimensions are for a child of a year or under.

New Appliances.

A SIMPLE CLUBFOOT RETENTION SPLINT.

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The treatment of a clubfoot should be commenced immediately after birth, when it can be cured by pressure. The lateral and then the anteroposterior element should be suc-

The footpiece is made from a tracing of the sole, as shown in Figure 1. It extends under the outer side of the sole sufficiently far back to make pressure on the cuboid and front of the os calcis. The posterior and inner parts of the sole are left uncovered so as not to interfere with the descent of the heel and arch. The footpiece extends upward on each side of the foot. If the foot is to be retained in a valgus position the inner lip is made higher than the outer.

The calf band is about $1\frac{1}{4}$ inches broad and extends half way around the limb posteriorly. It is placed as high as possible without interfering with the flexion of the knee.

The bars, being round, are pliable in any direction. They must be stiff enough to retain a given shape against the resistance of the foot. They are flattened at the ends where they are attached by two small rivets to the calf band and footpiece, and bent to the required angle of flexion. They should not be drilled except at the ends, because this would interfere with their modification.

Having made sure of the fit of the apparatus, it is covered and provided with straps and buckles. A piece of one-inch web long enough to encircle the limb with something to spare, and having a buckle attached to one end, is sewn or riveted to the outer face of the calf band, holes being punched for that purpose. The buckle is placed at the outer end. The whole splint, including the bars, is then covered with leather, or if that is not convenient, rubber plaster will serve, though it will require frequent renewal.

Cases of clubfoot present so much individuality that no hard and fast rule can be laid down for attaching the straps. Put them where they will be most effective and change them according to circumstances. In many cases of equinovarus, the following arrangement will be satisfactory: (Figures 2 and 3.) A heel strap of $\frac{3}{4}$ -inch web is sewn from bar to bar so as to pass just above the tuberosity of the os calcis when the foot is at the maximum of flexion. This strap must be made shorter than needed, because it will stretch. A buckle is included with the outer bar. Another buckle is sewn to the outer bar just below it. A small iron or brass ring or a piece of wire with an eye in each end is secured to the inner bar at the bend. Starting at the upper buckle, a piece of web is passed across the instep (1) through the flattened ring, or under the wire, thence back (2) over the dorsum of the foot, and once (3) or twice (4) around foot and footpiece, to terminate in the lower buckle. The first turn draws the foot down within the grasp of the apparatus and holds the astragalus back under the tibia. The circular turns around foot and footpiece press down the inner border of the foot and correct the varus. Clayland of New York, as he states in a personal communication, starts the strap at the lower buckle and after bringing it back over the dorsum passes it through a slot in the sole plate near its outer edge, thence in a figure-of-eight turn around sole plate, inner side of foot, dorsum and outer ankle, within the bar, to a buckle placed at lower part of inner bar. This gives a lateral pull on the ankle. The instrument is worn over a stocking and inside of a shoe which has usually to be made to order. It may thus be used in walking and holds the foot in dorsal flexion and pronated or supinated if necessary. To evert the foot, the outer bar is extended up to a pelvic band, joints being provided at the knee and hip, and a band around the thigh.

Care must be taken that the heel strap does not stretch so that the foot plate slips forward and presses only on the metatarsals. The pressure should be exerted also on the cuboid and front of the os calcis.

Even after the foot has been allowed to assume a rectangular position for walking, it should be retained at night for a long time in a position the reverse of the deformity.

As here presented, this apparatus is not suitable for use where the lateral deviation presents marked resistance. It is, however, susceptible of many modifications, such as the attachment of pressure plates to any part of the bars.

In reducing the strength of an acid by water the acid should be poured into the water, not the water into the acid, and the mixture should be stirred during the pouring.

AN X-RAY TUBE WITH ADJUSTABLE FOCUS.

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If one examines the outline of a shadow from a light emanating from a large area—e. g., a gaslight—it will be seen to compare favorably with the outlines on a fluoroscope or on a picture, when the x -ray is used from a tube having the anode out of focus. On the other hand, the outlines of a shadow emanating from a small area—e. g., an arc lamp—resemble the outlines on a fluoroscope or on a picture, when an x -ray tube having a sharply focused anode is used (Figs. 1 and 2).

The x -ray emanates from the molecular bombardment of the rarefied air in the tube on the surface of the anode. The

Figure 1.

structures of rarefied air are repelled from the concave disc or cathode forming the cathode rays or stream. This cathode stream striking the surface of the anode or disc in the center of the tube produces the x -ray. To obtain a sharp focus the anode must be a given distance from the cathode, just as an object must be a given distance from a lens to be in focus.

In making a Crookes tube by all methods used heretofore, it has been practically impossible to get the anode the required distance from the cathode, so as to obtain a sharp focus, as the stem supporting the anode had to be sealed in the glass by guess, and the tube exhausted before it could be tested,