ARTICLE XIV.

AN ADAPTATION OF THE PLASTER JACKET TO THE SPLINTS FOR THE HIP.

By JAMES NEVINS HYDE, M.D., Professor of Dermatology and Orthopedic Surgery, Chicago Medical College.

THE results obtained from the employment in spinal deformities of the plaster of Paris jacket, as presented to the profession by Prof. Lewis A. Sayre, of New York, have gained for it in many hands a deserved reputation. The simplicity of the device, the ease with which the jacket can be applied, its speedy relief of distressing symptoms, and the manifest improvement in the figure of the patient which it renders possible, have all contributed to enlarge the sphere of its usefulness. It is quite true that its smooth and perfect adaptation to the trunk requires a certain degree of skill and experience on the part of the surgeon, but these are prerequisites in so much of the labour that devolves upon him, the statement of the fact can scarcely be urged as an objection.

I have had occasion, during the past months of this year, to apply the jacket to a number of patients affected with spinal caries, and have been well satisfied with the result, not only in cases where the disease had occurred in the lumbar and dorsal regions, but also in those where the cervical vertebræ were involved. In the latter class I have suspended the head of the patient from the swivel bar, in the manner described by Dr. Sayre, in the report presented by him to the American Medical Association, in 1876, reproduced in the recently-published *Transactions* of that society. I merely refer to this apparatus at this time, in order to state that it suggested to me the device which I have since perfected and propose to describe in these pages—a device by which the plaster of Paris jacket is adapted to the hip splint, in such a manner that the necessity of a perineal band is entirely obviated, and the consequent chafing and excoriation of the perineum prevented, while extension, counter-extension, and mobility of the affected limb are made feasible.

For those who have not studied the details of the process by which the plaster of Paris bandage is applied to the trunk, a brief description of the method may be desirable.

A closely-woven merino shirt, sufficiently long to extend below the hips, is drawn over the body next to the skin, and then completely divided anteriorly and vertically with the scissors, so as to remove, on each side, the linen facings of the shirt with its button-holes and buttons. The divided edges are then smoothly folded, the one over the other, so that the shirt is brought snugly over the trunk, and the edges sewn together with needle and thread from the top to the bottom. A pad is next applied over the abdomen and beneath the shirt (especially near the region of the stomach), sufficiently large to supply, when it is removed, a space which will permit

of abdominal distension after meals. In order to insure its removal a strip of bandage is fastened to this pad, and left depending to the knee. Smaller pads of cotton batting are slipped in also, over the anterior superior spinous processes of the ilium. An opening is then made in the lower edge of the shirt, in front and behind, through which a strip of bandage is passed and tied between the thighs, after the shirt is well pulled down and a handkerchief or pad pressed against the perineum.

The patient is then supported by straps passing through the axillæ, and also under the occiput and symphysis mentis, so arranged that they can be shortened and lengthened at will. These straps are fastened to the extremities of a slightly-curved iron bar, suspended from a hook above by the intervention of a compound pulley. The patient is raised from the ground and held suspended by traction upon the cord which passes over the pulley; and when affected with Pott's disease he should be so suspended that the entire weight of the body may serve as an extending force. When the jacket is applied merely for the purpose of supporting a cervical rod or a hip splint, it is requisite that the weight of the patient should be taken from the feet, only so far as to insure a proper degree of spinal extension.

Two precautions should be taken: First, the patient should not be permitted to rest, for example, with one toe upon the ground, in such a posture that the axes of the trunk and limbs are not coincident or parallel; and second, the patient, if an adult, should not be allowed to aid in supporting himself by grasping the extremities of the suspending bar with his hands. I have seen both of these postures result in a maladaptation of the jacket to the body, when the latter was no longer suspended.

The trunk is now gradually incased by the application of bandages, three or four inches wide (made from what is sold in the shops under the name of "erinolino"), which have been drawn through freshly-ground plaster of Paris, and into which the dry powder has been thoroughly rubbed. The rollers are placed in a vessel containing sufficient warm water to cover them, and are ready for use as soon as the bubbles cease to escape. They are applied over the shirt without making any traction, commencing at the waist, passing down to the pelvis, and upward over the thorax. Prior to the completion of the last few turns, the shirt is divided transversely with the scissors, in a line about one inch and a half beyond the highest and lowest turn of the bandage, and the flaps thus left are folded outward (and downward or upward), when they are retained in place by the concluding turns of the bandage. By this means a cushioned edge is provided for the jacket, both below and above.

As soon as the plaster has sufficiently "set," the patient is laid in a recumbent position upon a mattress; and when the solidification is still further advanced, he is made to stand while the hip splint is applied to the jacket.

From the universal joint downward, this splint does not differ in princi-

ple from that modified by Dr. Soyre, as described in his recently published Lectures on Orthopedic Surgery, in Prof. Gross's System of Surgery, and other treatises. In the figure appended, which represents the splint as manufactured by the well-known instrument-makers of Chicago, Messrs. Sharp and Smith, extension is shown to be secured by a device which is intended merely to simplify the instrument, and thus render it less expensive, though the ratchet and cog with key may be used if desired. As seen in the figure, the extension is fixed by the aid of two screws, which hold in position the external upper and internal lower steel rods of the splint proper, the latter being provided with longitudinal slots so arranged that they may be slid into any desired position for extension, and then secured firmly by the screws. These screws are fixed only after the arm of the surgeon, which is capable of exerting far more than the requisite degree of force, has produced the necessary amount of extension.

The pad, which should rest above the great trochanter of the femur, can be made much smaller than that represented in the cut. From it rise two flat rods of malleable iron, the posterior somewhat longer than the anterior, which can be bent by the hand so as to adapt them to the curves of the plaster jacket. They are united by transverse slips of perforated tin, which are designed to give greater immobility to the artificial neetabulum, and to prevent any lateral twisting. The perforations are made alternately from one side to the other and the reverse, so that roughened edges may be presented to and buried in the plaster of Paris on either face of the strip.

Before the application of the splint, the dressing of the limb should be completed in the usual manner; and this should, in general, be accomplished before the application of the jacket, as the apparatus for night extension is usually first requisite, in order to bring the affected limb into a favorable position. For night extension with the pulley and weight, tabs of inelastic webbing are sewn to strips of Maw's moleskin plaster, sufficiently long to extend above the knee, and when properly secured by bandages, one strip on either side of the leg, with the tabs over the malleoli, the upper extremities are turned downward, and secured by the roller.

Tabs are also sewn to fan-shaped strips of the same plaster, many-tailed at the bases of the triangles, and the tabbed ends are secured, one on each side of the thigh, just where the jaws of the splint are to be fastened.

Fig. 1.

These strips of plaster are also nicely moulded to the limb, and held in place by a roller bandage, the many-tailed upper extremities being alternately reflected downwards, and secured by the final turns of the roller.

To apply the splint, the jaws are buckled to the tabs upon the thigh the strap which encircles the lower third of the thigh is also secured, and the splint shortened by the aid of the screws to its extreme limit. The iron and tin supports of the pad are then accurately moulded to the solidified plaster jacket, and a new series of turns of the plaster-of-Paris bandages are made to surround and fix the apparatus. As soon as solidification of this last dressing is established, extension is made and secured, and the patient released.

Fig. 2.

I append a cut, executed from a photograph by Mosher, of a little patient who has worn this splint with comfort and manifest advantage since the date of its application, April 20, 1877. She gave the history of a case of morbus coxarius of traumatic origin, and was found to be in the second stage of that disease when first examined. The affected limb had been subjected to continuous extension by the weight and pulley, for some weeks prior to the adjustment of the splint.

In order to remove the splint, for the purpose of using the weight and pulley at night, or for any other reason, the screws are removed, the upper arm of the splint, by the aid of the universal joint, is turned upward, and secured by a ribbon to the plaster jacket, while the lower arm, with the transverse pieces, is unbuckled, and the thigh thus left free.

The long hip-splint may be used with an adaptation to the plaster jacket of precisely the same character. My friend, Dr. John E. Oweas, Surgeon of St. Luke's Hospital of Chicago, has recently employed this device successfully in the case of a patient where he had excised the head of the femur, and for some time afterward had used the "wire breeches." In this instance, the fistulous openings in the soft parts made it particularly necessary to omit the use of a perineal band.

It will be clear from the preceding description that the hip-splint, as thus modified, provides for extension and counter-extension, with free mobility, and without perineal pressure. The idea of supplying a method by which extension and counter-extension could be secured without perineal pressure, but *with fixation of the joint*, has already produced practical results. The best apparatus of this sort is that devised by Verneuil.¹ It is applied as follows:—

¹ *Éléments de Chirurgie Clinique, etc.*, Guyou, Paris, 1873, p. 643.

The patient is dressed in a pair of cotton drawers closely woven, which rest directly upon the skin of the trunk and limbs, and reach as high as the waist. The drawers are then surrounded by a very thick layer of cotton-batting, the edges of which, in order to secure them, are neatly basted together. Three strips of iron are next superimposed, in order to prevent the completed dressing from cracking over the surface of the articulation in consequence of the movements of the trunk, and also in order to secure the requisite extension. Of these three strips, one is T-shaped, and its vertical part is placed behind the hip and thigh, while its two horizontal arms are brought round the body so as to encircle the abdominal muscles, and thus form a complete and solid belt. The extremities of the transverse portion are united by cords; they are made of such thinness that, if too long, they can be clipped by the scissors to the proper dimension. The upper end of the second iron strip is secured to the belt in the same manner, and the strip itself is applied to the external face of the pelvis and thigh. The third strip is similarly fastened, and rests upon the anterior face of the thigh; and the ends of all are well padded in order to obviate any uncomfortable or injurious degree of pressure. Then the wadding and iron strips are neatly covered in by the ordinary roller bandage, the precaution being taken to fold downward (or upward) and outward, the edge of the drawers projecting over the cotton wadding both at the waist and at the knee. This makes a thick and resisting cushion, which protects the patient from undue pressure when the apparatus has become solidified. In passing from the pelvis to the thigh, the bandage should be crossed as in the spica of the groin. Outside of the whole, the silicate of potassa or dextrine dressing is applied; and as soon as this has become perfectly solidified the patient is dismissed.

I do not doubt that the use of the silicate of potassa or soda would be preferable to the employment of plaster of Paris in applying the jacket, not only in the case of patients affected with hip disease, but also in those who have caries of the spinal vertebrae. The chief advantages which would thus be gained, in the matter of diminishing the weight of the dressing, and decreasing the time which must elapse before it becomes perfectly dry, are considerations of importance.

ARTICLE XV.

A BULBOUS-HEADED DILATING URETHROTOME. By R. A. KINLOCH, M.D.,
Professor of Surgery in the Medical College of the State of South Carolina,
Charleston, S. C.

In the treatment of a certain class of urethral strictures, the operation of internal urethrotomy has of late years gained in the favour of the profession, and I believe that it merits higher claims, both for promptitude