

Because the ligaments of the knee-joint will not permit of greater extension without becoming painful.

If we stand in a position in which the knees are thrown back to their full extent, they soon become painful, and the position cannot be maintained without great suffering.

We usually stand with the knees bent at an angle of one or two degrees, and if straightened more they become painful.

Some patients will bear fifteen, some twenty, and some twenty-two pounds extension, which is the extreme amount that should be employed. By no means put on such an amount of extension as causes the patient pain.

A few years ago, at the suggestion of German surgeons, who have done so much good and praiseworthy work, American surgeons began to use plaster-of-Paris in the treatment of fractures of the femur. In adopting that plan of treatment, they went a step backward instead of forward, for they adopted a method by which they could not secure any degree of extension and counter-extension, as any one can satisfy himself by watching a case throughout its treatment. It is easy of demonstration that it does not afford any extension and counter-extension. If the plaster is put on so that pressure is made on the perineum, it will cause ulceration. I have seen a case in which ulceration extended through the perineum, and up the back six or eight inches, and as deep as my hand. If you do not use the perineum to make pressure against, you must use the side of the thigh.

What kind of a surface does the thigh furnish? It is an oblique surface; there is a gradual decline from the hip to the knee, and inasmuch as the plaster will loosen within four or five days, so that you can run your hand in between it and the surface of the limb, there is no counter-extension at all; not the slightest.

The entire foot and limb may be enclosed in plaster as snug as you please, but you have no counter-extension; not a particle. While the plaster was being used in this hospital, I saw more shortening than I ever saw before in my life, and I saw two or three deaths, occasioned by the use of the plaster-of-Paris dressing.

These cases have been carefully recorded in the 5th edition of my work on Fractures.

I think we have gone several steps backwards when we use the plaster-of-Paris dressing, and I am happy to say that it is almost abolished. At the present time there is scarcely one of my colleagues in this hospital who employs it in the treatment of fractures of the thigh; there may be one, but I am sure you will not use it more than once or twice in country practice.

The apparel, when complete, as I usually employ it, is generally known as Buck's extension. But Dr. Buck was not the first to employ the adhesive

plaster, or to suggest raising the foot of the bed for the purpose of making counter-extension, and these are the most essential features of the treatment. So it is with other parts of the apparatus. We are indebted to Dr. Buck for a great deal in the treatment of fractures, but this apparatus has been so long employed in this country and so much modified that it may with more propriety be called American. In this case the apparatus is complete, and let us see what we have. *First*, we have two broad strips of adhesive plaster reaching from the knee to a few inches below the foot, and secured to the sides of the limb by means of a roller bandage. A piece of board is attached to the lower ends of the strips of plaster, and from the centre of the board a cord passes over a pulley fastened to the foot of the bedstead. In some of these cases you will notice that we have two pulleys, and in others only one.

Originally, a simple straight piece of board, having a mortise in it, as you see, and carrying a pulley, was secured in the upright position to the foot of the bedstead. The upright seen here is iron and can be adjusted and removed with ease; it is an improvement; that is, it is somewhat more convenient than the original wooden board.

The piece of board to which the adhesive straps are attached must be of sufficient length, so that when extension is made they will not impinge upon the malleoli.

The strips of adhesive plaster need not go above the knee.

Then as to the counter-extension. We have, as you see, no perineal band. We have simply raised the foot of the bedstead about four inches, and have seen that the patient rests his head, *not his shoulders*, upon a pillow. We next apply four short side-splints to the thigh; three will not answer; it is necessary to have four independent side-splints, which nearly encircle the limb. We are employing here splints constructed of felt, which is made of several thicknesses of cotton cloth. This material is one of the best that can be employed for this particular purpose as it is easily worked, is sufficiently flexible, and at the same time possesses sufficient firmness.

These side-splints are secured in position simply by encircling the limb with four or five fillets and tying them with a convenient knot. In this manner the fragments are kept in proper coaptation, and the splints can be easily removed to afford an opportunity for inspecting the limb.

In addition, you see fastened to the side of the limb and to the side of the body a long splint, about four and one-half inches in width extending nearly to the axilla, and having at the lower end a broad cross-bar to prevent its tipping.

What is the use of all this? *First*, it prevents eversion of the limb.