of both loose on the sterile field, or to use test-tubes to keep them in place. The first method does not prevent the two instruments from slipping down and becoming contaminated; the second proved too costly, because test-tubes broke and were hard to replace. Therefore, the holder* was constructed out of aluminum (Fig. 1). To fasten it in place, one has merely to pull the sterile sheet through the two oblong holes and clip the two tips of the sheet together with a short clamp (Fig. 2). To clear the clamp from the operative field, its handle should be pushed behind the free ends of the tubes. In this fashion the holder can be hung up secure, firm, and wherever desired.

THE "SPLIT MATTRESS BED" IN THE CARE OF SPINAL CORD INJURIES

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One of the greatest problems in the treatment of spinal cord injuries is the care of decubitus ulcers and the management of the urinary catheter. Munro, with his vast experience in the prevention and handling of decubitus ulcers, has emphasized the following cardinal rules: frequent turning of the patient; the maintenance of tightly drawn dry sheets beneath the skin; keeping the skin clean, massaged and dry; and the avoidance of all heretofore suggested contraptions, such as doughnuts, air mattresses, sawdust beds, Bradford frames, et cetera. Others have stressed the importance of maintaining a normal plasma protein level.

Unfortunately, the vicissitudes of war with its attendant nursing shortage do not permit of such ideal care for these often forgotten patients in army and civilian hospitals. The author has observed 34 overseas returnees with complete transverse myelitis from spinal cord injuries at levels ranging from the 4th cervical to the 2nd lumbar vertebra. All but one of these patients displayed decubitus ulcers varying from 4 to 12 cm. in diameter and depth from skin maceration to bony sacrum and ilium. The sad commentary from most of these patients was that they had not been turned frequently in some stage of their convalescence, either at overseas installations or during the 2 to 7 days required for their evacuation by air. Since the patients were anesthetic below the level of the lesion they did not complain and, in fact, discouraged frequent turning. None of these patients had bed sores on the anterior surface of the body for the reason that they had not been placed in the prone position. The explanation that these patients commonly gave for this probably echoes the impressions of the profession, namely, that imperfect drainage of the bladder occurs in the face-down position because of the pressure of the body lying on the urinary catheter or rubber tubing.

A most satisfactory and simplified method of utilizing the valuable face-down position in cases of transverse myelitis has been developed. It may be called the "split mattress bed" and is prepared as follows (Fig. 1). Two regular thin felt mattresses are folded in the center and placed at opposite ends over the springs of any hospital bed with 8 inches' separation from each other. These are covered separately with tightly drawn sheets. Next, two firm, thin pillows, preferably of straw, are rolled tightly and placed about 6 inches apart in the groove between the mattresses. Thus a rectangular space measuring about 8X6 inches is formed in which the genitalia are suspended and the catheter permitted to descend directly between the bed springs into a bottle placed on the floor. The indwelling, suprapubic, or perineal catheter can be adapted equally well to this arrangement. Only a short rubber tube is required between the catheter and the bottle.

At first this method was born of necessity to avoid pressure on severe decubitus ulcers of the posterior and lateral aspects of the body. Trial disclosed that it was by far the best position for these patients. After initial reassurance the patients are surprised to find that they can live comfortably in the prone position. It is most gratifying that the bed sores

* Tec. 4 H. Perrin of the 94th Evacuation Hospital made the holder from parts of a German plane.
respond favorably to the absence of pressure. In this series of cases no medicinal ingredients were applied locally to the ulcers inasmuch as it was felt that the simple avoidance of pressure is the basic principle in their treatment. Upon arrival of the patients all devitalized tissue was carefully dissected away in order to favor drainage and prevent continued infection. The ulcer beds were lavaged daily of any accumulated exudate with \( \frac{1}{2} \) strength hydrogen peroxide or normal saline solutions. A cradle is used to prevent bedding from touching the buttocks or heels. Of all patients treated in this manner there was either complete healing with epithelization in those who remained in the hospital over 2 months or there was visible filling of the ulcers by healthy granulations in transient patients observed 5 to 10 days. The patients were unanimously enthusiastic about the method. This same principle was ideally

adapted by the author in the rail transportation of a patient 1800 miles by folding 2 Pullman mattresses. A basin placed directly at the groove beneath the mattresses and under the suspended genitalia was emptied of urine at intervals.

One observation which needs further confirmation is that decubitus ulcers did not develop on the anterior surface of the body in patients who were maintained in the face-down position for many days at a time, and shifted only momentarily for routine nursing care. Exceptions occurred in 2 patients who were severely debilitated, and had extensive lateral and posterior pelvic ulcers and marked nutritional hypoproteinemia. Restoration of their plasma proteins and alternate utilization of all 4 reclining positions led to complete healing of the decubitus ulcers on the anterior body surface of one patient and decided improvement in another before he was transferred. A 26-year-old male with complete transverse myelitis from a fracture dislocation at the midthoracic spine remained in the prone position on the split mattress bed for 10 months without the development of an ulcer on the anterior surface of his body. He left this position only for brief intervals on alternate days when he was placed on his side for attention to his catheter. In explanation, it might be conjectured that there are fewer bony prominences anteriorly. The costal cage is in a constant state of movement.

\[ \text{FIG. 1.} \]

\[ \text{SPLIT MATTRESS BED IN THE CARE OF SPINAL CORD INJURIES} \]