suit to every emergency, but as a simple and efficient form of axis-traction, easily within the reach of the general practitioner, and well suited to his use because applicable to the individual forceps with which he is already familiar.

THE USE OF HEBRA'S CONTINUAL BATH OR WATER BED IN SURGERY.

BY OTIS K. NEWELL, M.D.,

*Assistant Demonstrator of Anatomy in the Harvard Medical School,
Surgeon to Out-Patients at the Massachusetts General Hospital.*

THE subject to which I wish to call your attention to-night is one which appeared to me to be of great interest when I wrote the present paper, about three years ago. At the suggestion of Dr. H. H. A. Beach I referred the matter to the late superintendent of the Massachusetts General Hospital, Dr. Whittemore, who also took an active interest in it. Owing to his unfortunate illness, however, its further consideration at that time was postponed. For various reasons I have been unable to again attend to it until now, when, I am happy to say, Dr. Pratt, the present superintendent of the Hospital, has the construction of such a bed under consideration.

The continual bath, or water bed, of Hans Hebra had won such universal approval from those who had seen it in operation at the Vienna General Hospital that a plan and description of it was appended to the report of 1882, in order that other institutions might construct similar ones. It particularly interested me while I had opportunities of observing it in use, and after reading in regard to it, by the very great advantages which it presents for the treatment of certain surgical cases. The information given below has been obtained from the appendix to the hospital report, Kaposi's lectures, and my own observation and inquiry in regard to it. To Hebra's bed have been added improvements suggested from time to time, and the one shown in the plan has resulted. Seven such are now in use at the Vienna Hospital, and at times are simultaneously occupied. Their best use is perhaps in cases of severe burn, but they are also used to great advantage in gangrene, bed-sores, and in fact in many cases which a familiarity with the bed would show to be adapted to its use. I shall here speak particularly of extensive burns, as the great value of the bath is so apparent in their treatment. Any theoretical objections to its use are to be answered by the fact that patients have remained in the bath as long as 385 days and nights, and "taken nothing therefrom but their recovery."

There are many practical points in its favor. Severe cases of burn die here as elsewhere, but are relieved at once of their pain. If the case admits of recovery it progresses under the most favorable circumstances. Freed from his pain, the patient lies comfortably, and changes his position at will. Fever rapidly subsides. Sleep and appetite are acquired, and the system brought into condition to compensate for the great loss of pus. The dangers of erysipelas and sepsis are slight, and "pocketing" of pus is avoided. The severe nervous strain caused by the painful removal of more or less adherent dressings, and the necessary amount of equally painful lifting and turning are avoided. The wounds

granulate splendidly, and often so luxuriantly as to require "touching up." Pus is at once removed, instead of remaining to become putrid and fill the room with its odor. In fact, many disagreeable subjective and objective complications are obviated, and not only the patient but the attendants made comfortable. The cost of such a bed is, according to the superintendent during whose administration those in Vienna were introduced, about seventy dollars, and in addition to the outlay dependent on their use to be reckoned as slight compared with that of the dressings they replace.

The beds should be in a light, well-ventilated room, with cemented or tiled floor, and walls painted with oil colors to withstand the effects of moisture. The water-supply may be taken from the main boilers, and the waste conducted through ventilated pipes.

The bed consists of an ordinary zincked tub about .002 mm. thick, reinforced by iron bands and corner pieces, and supported by an oaken frame. At the head and foot is a windlass, to which the mattress frame is attached by chains, so as to be raised or lowered as needed. The mattress frame on which the patient has a swinging support in the water is of galvanized wrought iron, spanned with wire of similar material. To regulate the height of the patient's head and shoulders it is hinged at the upper end, so as to work like the ordinary bed rest, and may be modified to accommodate more than ordinary sized patients, as shown in figure at Z.

Filling of the tub is accomplished by a mixing vessel at the head of the bed, into which hot and cold water pipes are conducted. The water flows in through pipes at the bottom and out of waste pipes at the top. At the head of the bed is placed a strap for the patient to grasp in changing position. See figure at S.

¹ Read before the Surgical Section of the Suffolk District Medical Society, March 7, 1888.

The plans are here about one thirty-fourth natural size, the smaller details on a somewhat larger scale. Originally the water was allowed to flow continuously from a boiler heated by lamp flame. It has since been found that this is superfluous, and that the water is, in addition, on account of the existence of currents, unequally warmed and renewed. On this account it is the present custom to renew the water but three times daily, and regulate its temperature in the mean time by fresh additions. As the tubs are made to hold a large quantity, 6.75 hektolitres, and are surrounded by a wooden frame covered with cross-pieces and blankets, loss of heat is slight, and the addition of fresh water but little needed. The determination of the temperature is left mostly to the patient's feelings, and these indicate, as a rule, about that of the body. At first, water at about 30° C. feels much too warm, then too cool, and must soon be raised to about 35° or 37° C., which is afterwards adhered to. Patients remain constantly in the bath, and are only raised from it for use of the bed pan or urinal. They can thus pass days, weeks, and even months uninterruptedly, while all their functions and nourishment, as much as the disease makes it possible, go on normally.

The only somewhat disagreeable complication affects the palmar and plantar surfaces, which, similarly to those of washerwomen, shrink, become white and folded, and at times cause frequent and sharp pain. This tends to subside after applying any fatty substance, and will disappear spontaneously in from two to five days. The epidermis of the rest of the body suffers no important changes. In individual cases a papulous eczema occurs on those parts subject to frequent changes from wet to dry, principally the arms and sides of the thorax. This sort of water eczema heals without treatment.

The danger of drowning, although appearing at first thought to be considerable, is slight, and in spite of the frequent use of the beds, such an occurrence has never been known. Strong and self-dependent patients awake the moment their mouths touch the water. Weak or disabled ones may be kept from sliding down by a folded cloth passed under their shoulders and arms. In private practice an ordinary or portable bath tub may be used.

Instead of using, as is the present custom, the ordinary hair mattress, it would be much more cleanly and antiseptic to use a rubber-covered mattress attached to the frame.

THE TREATMENT OF FRACTURES OF THE EXTERNAL CONDYLE OF THE HUMERUS.¹

BY GEORGE W. GAY, M.D.
Visiting Surgeon, Boston City Hospital.

FRACTURE of the external condyle of the humerus, extending more or less deeply into the elbow-joint is often difficult to treat in such a manner as to prevent deformity and impaired motion. Dislocation of the head of the radius forwards causing it to impinge upon the shaft of the humerus in flexion of the forearm is a common occurrence, and unless corrected, flexion can never be made beyond a right angle, and seldom quite to it. Another complication not infrequently met with in this injury is dislocation of the radius and ulna

¹ Read at the meeting of the Surgical Section of the Suffolk District Medical Society, March 7, 1888.

backwards and outwards, thereby preventing flexion beyond a very slight degree.

To prevent the forward displacement of the radius I have made use in several instances of the ordinary internal angular splint set at an acute angle. One case, that of a child, was treated without any splint by reducing the dislocation, and placing the forearm at an acute angle and securing it in position by adhesive straps and bandages. The result was satisfactory, but I do not recommend the method for general use, as pain and other mischief might readily follow the treatment, unless great care was taken to avoid it. It is impossible for anterior displacement to take place with the arm put up at a moderately acute angle, as there is no room for the head of the radius to slip on to the anterior surface of the humerus. The angle need only be acute enough to preclude the possibility of a forward displacement of the radius.

The lateral dislocation of the radius and ulna can be controlled very satisfactorily by means of lateral angular splints, one on either side of the arm. These splints, together with the anterior, or as it is usually called, the internal angular splint, applied to an arm, afford a very complete support to the elbow-joint. The bones are held firmly in position, the joint is well supported and with the arm in a well-fitting sling the patient is usually as comfortable as can be expected.

I have never treated this class of injuries to the elbow in a straight position, and cannot see any advantages to be derived from the method. Should any ankylosis result from the injury it is far better that the forearm should be at or near a right angle, as this position enables the patient to do very much more than any other in the way of dressing, eating, etc.

The broken arm is examined every three or four days. Gentle passive motion is used after ten days, and it is varied in degree according to the indication. Care is taken not to light up a fresh inflammation by this measure, as more is lost than gained by so doing. The joint often improves in mobility for a year or more, hence a too hasty opinion should not be given in these cases.

In conclusion, I would urge upon the younger members of the Society the importance of making the first examination and dressing with the patient under ether. A more careful diagnosis can thus be made and a better position can be secured for the broken bones. Guard against an anterior dislocation of the head of the radius with the fragment of the external condyle, and also of a backward or lateral displacement of both bones of the forearm. The arm once placed at an acute angle, and properly secured in that position, it is hardly possible for either of these complications to occur.

TUBERCULOSIS OF THE PERITONEUM; EVACUATION OF ASCITES BY LAPAROTOMY; CURE.¹

BY J. W. ELLIOT, M.D.

THE patient was a delicate-looking girl of fourteen years, with red hair. Her mother brought her to me on account of an enlargement of the abdomen. This enlargement had been noticed about a year previous, and had steadily increased. The child had lost health and strength, but complained of nothing else.

¹ Read at the meeting of the Surgical Section of the Suffolk District Medical Society, March 7, 1888.