LIFE-SAVING SURGERY.

III.—OPERATING THEATRES AND ASEPSIS.

IN a large hospital, where surgical work is constantly going on, the centre of the institution, the one point which is touched by all the patients, the one department whose appliances are used in common by the occupants of all the wards, is the operating theatre. Any sanitary deficiency, any septic taint in this room may therefore be widespread and disastrous in its effects, and we need not be surprised that this risk is one to which surgeons who understand the necessity of asepsis are thoroughly awake. In some hospitals it is not at all an uncommon thing for major operations, especially abdominal sections, to be done in the special wards in which the patients are to be nursed. Even in some of the great school hospitals this is the case to some extent, and although no doubt it is done partly from a desire to save the patient the fatigue of removal after operation, we cannot doubt that to some extent surgeons are inclined to favour this course, because while they feel sure of the patient's surroundings so long as they remain in their own wards, they are not quite certain what may befall them in a co-operative theatre.

At the Samaritan Hospital each surgeon has his own operation wards, which are thoroughly cleaned before each operation, and if a death or any suspicion of septic mischief occurs the ward is whitewashed before it is used again. Each ward has two beds, one for the patient the other for the nurse, and here the patient stays after operation till all risk is over—about ten days after ovariotomy and until removal of the clamp after removal of fibroids. Each surgeon also has his own instruments. The difficulty of the co-operative theatre is thus got over, and each operator treats his cases in his own way. It is easy to see that in a hospital managed on this system, if any one surgeon chooses not to believe in antiseptics, or accepts a lower standard of asepsis, he at any rate does no serious damage to the results of his colleagues, and it seems probable that under such a system of separation good results may be obtained from a less complete antiseptic routine than would be safe where all degrees of carefulness meet in the same theatre. The following, for example, are the measures taken by Mr. Alban Doran in regard to instruments and dressing:

The instruments and the reels containing ligatures and sutures are placed in carbolic solution (1 in 20) for half an hour, and this solution is diluted to 1 in 40 by the addition of hot water at the time of operation. The sponges, which if necessary have been previously disinfected by sulphurous acid, are dealt with in the same way. The trays used for the instruments are of metal, and are disinfected by carbolic 1 in 20. Dry dressings are used but these are not baked, and the water used at the operations is not boiled.

The recent rearrangement of the women's ward at St. Bartholomew's Hospital is another example of the modern tendency. Martha Ward, which is devoted to diseases of women under the charge of Dr. Champneys, physician to the ward, and consists of one large ward and three separate rooms, containing two beds each, together with operating theatre, nurse's rooms, bath rooms, corridor, etc., all separated by a closed door from the general staircase.

The small rooms are set apart for special cases and in them the majority of the abdominal sections are nursed.

Mr. Harrison Cripps has been appointed operating surgeon for the ovarian cases, etc., acting in association with Dr. Champneys, and from his description in the *St. Bartholomew's Hospital Reports*, we partly take our account of the theatre.

The floor is of teak, very clean and bright, although probably not so good as if it had been made of mosaic laid in cement. The walls are painted, and although Mr. Cripps laments that they were not lined with Minton's tiles, we are inclined to think they are better as they are, the joints between tiles being always apt to hold dust. Hot and cold water are laid on to a marble washbasin, the waste pipes of which are unenclosed, and discharge directly into the open air. Above the washbasin is a glass shelf, which supports two glass barrels holding three gallons each, one for carbolic lotion the other for corrosive sublimate solution.

The operating table (Fig. 1) consists of a framework of polished brass supporting a shallow copper tray, 3 inches deep, forming a hot water reservoir over which is a slab of plate glass 1 inch thick. This glass top can be lifted off, but by means of a tap and funnel the water can be changed without removing it if required. When the patient has been placed on the table a small glass topped table is placed over her knees, which can be slid up and down, and is found very convenient for supporting the sponge bowl, or any instrument which requires to be laid down for a moment.

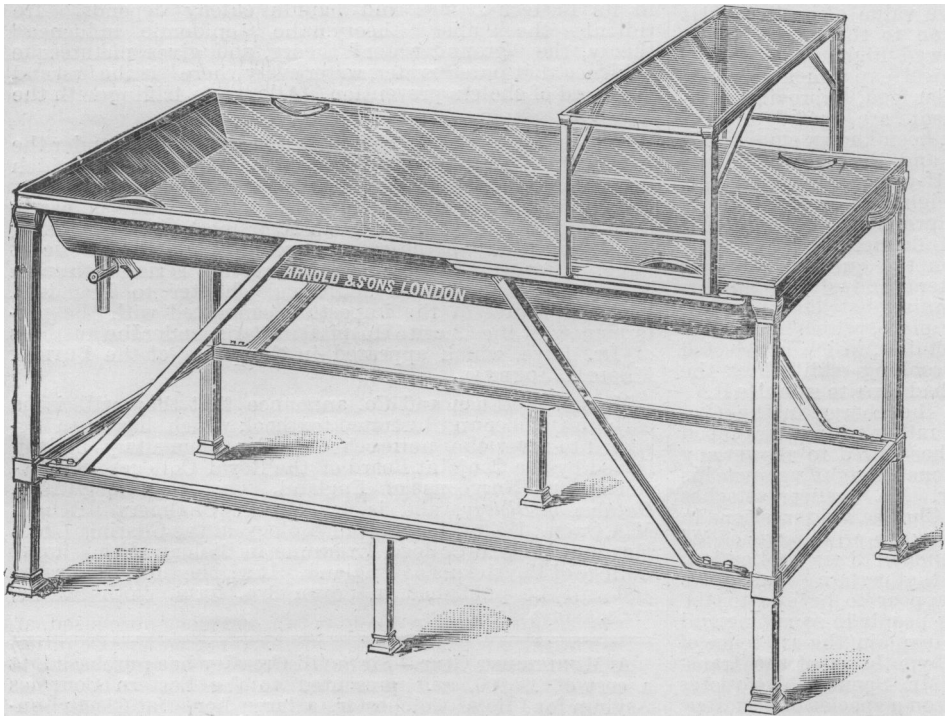

Fig. 1.—Plate glass operating table with hot water tray. The small glass shelf goes over the patient's knees, and can be slid backwards and forwards at pleasure. It is most useful for placing the sponge bowl and instrument in actual use whilst operating.

The tables for dressings and instruments (Fig. 2) are also of brass, with glass tops, and are so shaped as to form a semicircle behind the operator—"a polite method of preventing spectators crowding over the operator's shoulder." The irrigator (Fig. 3), is of glass, and holds three gallons, and is slung by a rope and pulley.

There are three sterilisers—for the water, the instruments, and the dressings respectively. All water used at the operation is boiled; the dressing steriliser is heated to 400° F., and then allowed to cool, the dressings not being removed until the moment of using. The instruments are boiled before being put away, but not as it would seem before being used. They are kept in an airtight glass-fronted case.

All the arrangements of the theatre—the glass, the brass, the brightness of the instruments, and the perfection of cleanliness

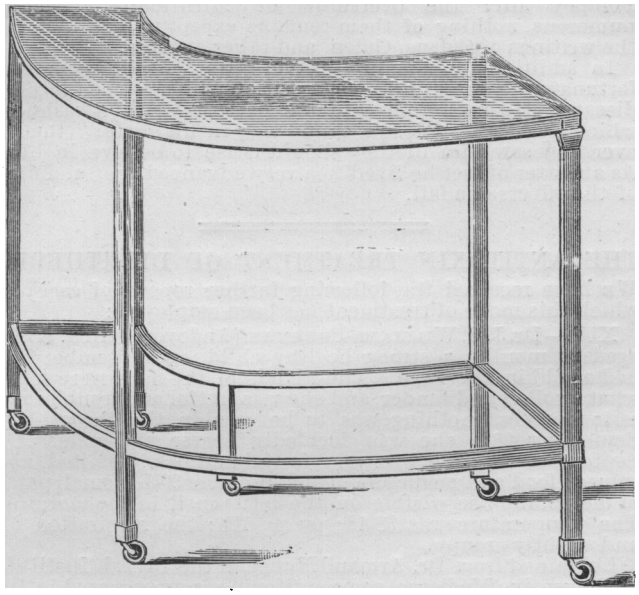

Fig. 2.—Narrow semicircular glass table for the instruments, which fits round the operator.

which one sees all round—are very pleasant to look upon, and must conduce greatly to the success of operative work, even though they may give rise to the distressing reflection in the mind of the ordinary practitioner that, if these be the essentials of aseptic surgery, its joys, alas! are not for him.

At the Royal Ophthalmic Hospital, recently erected at St. George's Circus, Southwark, there is a very perfect little operating room, the details of which have been most carefully thought out. At first sight its most striking feature is its emptiness. No table, no chair, no fireplace, no hot water pipes, no ledge anywhere on which one can even put one's hat. The floor is a marble tesselated mosaic; the walls are of large slabs of alabaster, the corners being worked to a curve so that there are no angles anywhere; the windows are set in gun metal frames, the washbasin (designed by Mr. McHardy) is a single piece of pottery ware having no hidden overflow, the waste being plugged by a brass funnel which rises to the top of the water and down which the overflow escapes.

Warmth is supplied by a metal skirting board below the window, having behind it hot water pipes, over which the entering air is made to pass.

The patients are wheeled in upon their beds, and are not removed from them for operation. The bed head can be removed and the upper end of each hollow leg so laid bare is made to furnish support for a small circular wooden table, on one of which the instruments are placed, lying between the folds of a boiled towel, and on the others are the dressings. Everything about the room is hard and non-absorbent, and as far as we could see the whole place could be washed down with hose and jet with no harm to anything except the electric light. The instruments are boiled immediately before being used, care is taken that the cocaine solution is sterile, the patient's face is bathed with boracic acid solution "to lay the dust," as Mr. McHardy remarked, but otherwise no chemical antiseptics are used.

Several other hospitals have reorganised their operating rooms among which we may mention St. Thomas's, where marble mosaic pavement has been introduced, and the walls have been lined with enamelled slate to a height of 10 feet; above this they have been painted. Thus the whole can be readily and frequently flushed and washed down. Large porcelain sinks also have been fixed, and a Berkfeld filter. An unlimited supply of sterilised hot water at any temperature is available.

Antiseptic solutions are kept in glass jars arranged on marble slabs, and complete sterilising apparatus for the surgical instruments and sponges has been placed in each. Each theatre has also been provided with a complete set of nickel-plated instruments in a glass case suited to aseptic surgery, which are never removed from the theatre for use elsewhere. New hot water coils have also been provided, capable of being kept thoroughly free from dust and dirt.

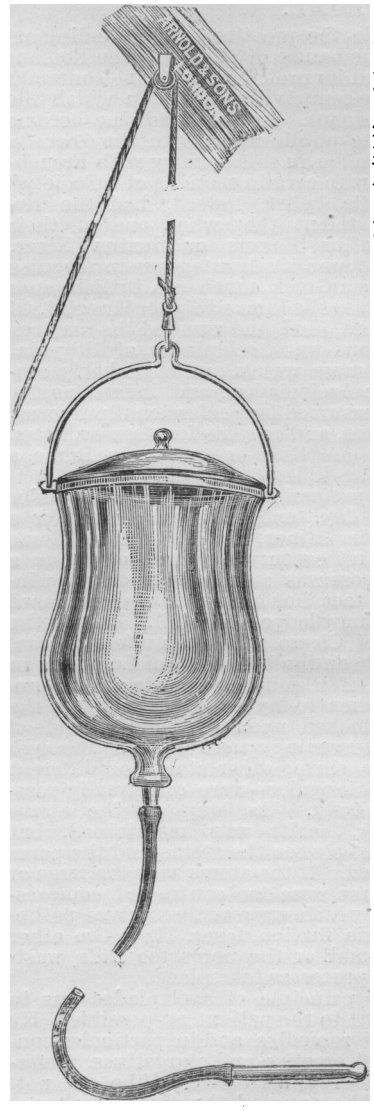

Fig. 3.—Bell glass irrigator.

The logical outcome of recent surgical experience is that the highest possibilities of surgery will only be attained when the surgeon is entirely relieved of all anxiety as to septic infection, when, in fact, surgery becomes a completely aseptic proceeding. The tendency in the practice of many surgeons is to attain this end by an elaborate system of cleanliness rather than by the use of chemical germicides at the time of operation, and it is sufficiently obvious that by the exercise of constant care and endless attention to small details an apparent independence of antiseptics can be attained. Unless, however, we are prepared to admit that all surgery is to fall into the hands of those who can surround their patients with this elaborate *cordon* of precautions, we cannot avoid the question whether after all the certainty of antisepticism attainable by anyone amid any surroundings by the use of chemical antiseptics is not a more practical aim than an asepticism attained by the practice of so complicated a system of cleanliness, failure in any branch of which may lead straight to disaster.

Even for the specialist in his own hospital, who can organise his own surroundings, this is a matter of no small interest, but as a question of teaching, of demonstrating a safe system of surgery which can be practised by all sorts and conditions of men amid all kinds of surroundings, we see no escape from the conclusion that antiseptic surgery in its broadest sense is likely to be the most successful. Boiled instruments, boiled towels, chemically purified hands and sponges, chemical disinfection of the patient's skin, surrounding the area of operations by materials which not only are clean but whose asepticity is secured by recent immersion in antiseptic solutions, and dressing the wound with substances which not only are themselves, if possible, aseptic, but contain within their fibres a reservoir of antiseptics—these are measures by which a surgeon may not only make himself independent of the idiosyncracies of his colleagues in a hospital, but may safely do operations amid strange surroundings. While offering our fullest tribute of praise to the efforts being made to introduce aseptic conditions into our hospital operating theatres, we must not hide from ourselves the fact that the most useful surgery to teach to students, who in a few years' time will be scattered over the surface of the globe, is a system which can be practised anywhere, and which will give good results even when the surroundings are far from satisfactory.