THE OPERATION THEATRE, ROTUNDA HOSPITAL.

By W. J. SMYLY, M.D.,
Ex-Master.

In many of the Dublin hospitals the operation theatres have been altered or rebuilt in accordance with modern views on aseptic surgery. To my own lot has fallen the pleasant but responsible task of planning my own theatre in the Rotunda Hospital, and I feel so gratified with the result that I think it worth bringing under the notice of others.

THE OLD OPERATING ROOM.

During the first three years of my mastership of the Rotunda Hospital I operated in a small room in the Auxiliary Hospital, which had been set apart for abdominal work. It was a long narrow apartment about 8 feet high, and was not untruthfully characterised by an American who honoured me with a visit as "the worst operating room in Europe." In that room, however, I learned a good many things which helped me in planning the present theatre. It was dimly lighted by small windows which faced the south. The disadvantage of this aspect was that when the sun shone brightly the light entered the room in the form of a sunbeam, which caused such a glare from the patient's abdomen that it was difficult to see into the cavity when it was opened; and the field of operation was further obscured by the shadow thrown over it by the hand of the operator. But whilst it concealed what I desired to see the sunbeam revealed the fact that the air of the chamber was full of dust. This room was heated by a small open fireplace, which afforded so little warmth that it was necessary to cover the patient with blankets, and when these coverings were disturbed, either by taking them off or throwing them over the patient, I have often seen a cloud of fluff thrown up into the air, floating about in the sunbeam, and slowly settling down into the instrument trays, and doubtless into the abdominal cavity also. I could not regard these hairs of animal tissue as altogether innocuous, and I have come to look upon blankets, especially hospital blankets, as dangerous, and as far as possible to be abolished from the operation room. If the blankets have been arranged some time before the commencement of the operation and carefully covered with aseptic towels, the risk is small, but occasionally they must be disturbed or removed; when, for example, artificial respiration is resorted to, or the urethra or vagina have to be reached, or the patient changed from the horizontal to the Trendelenburg position.

The imperfection in the illumination of the room was to a certain extent corrected by a hand-glass used as a reflector, but though unavoidable under the circumstances, this method had the disadvantages of introducing an additional assistant, and of intercepting the view of onlookers.

When the new labour wards were constructed, I removed into one of them, and for the next few years all my abdominal work was carried on in the Lying-in Hospital. Here I had a clean room, a large window with a northerly aspect, a plentiful water supply, and gas to heat the sterilisers; but I had still the disadvantage of the close proximity of spectators, who, in the limited space, vitiated the atmosphere so that it often became oppressive; pressed upon the operator in their eagerness to see what was going forward, and interfered with the arrangements by leaning upon the tables and hampering the assistants. Besides, I found it impossible, in spite of locks and keys, to prevent the frequent opening and shutting of doors, which caused currents of air doubtless laden with dust.

THE NEW OPERATING ROOM.

From the experience gained under these disadvantages, I came to regard the following as the chief points to be attained in the construction of an operation room:

1. A pure, warm atmosphere free from dust.
2. A good steady light.
3. A plentiful supply of pure hot and cold water.
4. Simplicity in construction and furniture, so as to permit of thorough cleansing.
5. Such arrangements as would enable the largest number

of spectators to obtain a full view without hampering the operator or his assistants.

SECTION

I have seen in books a southerly aspect recommended, but in my experience this light is too variable and uncertain. A north light is regarded by artists as the best; it is more diffused and steady than any other, and obviates the use of blinds. I had the theatre therefore placed upon the north side of the building with three large plate glass windows and a glass roof, the light from which penetrates to the deepest parts of the pelvic cavity.

A GLASS SCREEN.

The room is divided into two distinct parts by a large glass screen. In the first or outer compartment are placed the basins, sinks, glass case for instruments, sterilisers, etc., and a gallery for spectators. The inner compartment or operation room proper is of the simplest possible construction. The ceiling is glass, the walls covered with cement and painted with white enamel; the floor is tiled, and slopes towards the outer wall, which is perforated by a glazed waste pipe wide enough to admit the hand so as to be easily cleansed, and

closed when desired by an indiarubber plug. The corners of the room are rounded off, and the furniture is limited to an operation table, stools for the operator and two assistants, tables for basins and instruments, all of metal and glass, and a small hot-water steriliser.

In planning this part of the room I had in mind Tyndall's box; when the air in the box contained dust he could see a sunbeam passing through it, but when the sides had been smeared with glycerine and the box left at rest, the air became so free from refracting particles that the ray could be no longer seen. So this part of the room was not only cleansed in the ordinary way, but on the morning of the operation it was thoroughly doused out with a hose, and the doors and windows being closed I hoped and believed that most of the germs floating in the air would fall upon and be retained by the wet walls and floor. I do not want to attach too much importance to the purity of the atmosphere, but I cannot regard it as altogether unimportant, and experiments have proved that it is not so. I would call attention especially to those instituted by Mironow in the women's hospital in Bonn. He found that when first opened the abdominal cavity was almost always free from germs, whereas at the end of an operation he discovered micro-organisms in greater or less numbers in 20 out of 28 cases, and these were of the same kinds as those which he discovered in the air in the immediate neighbourhood, which he took care to examine at the same time. He also found that the more prolonged the proceeding the larger, as a rule, was the number of microbes. Another fact of interest in connection with these observations was that in 11 out of these 20 cases there was subsequently a considerable rise of temperature. My own experience corroborates these views. When I visited Berlin some three years ago I was struck by the fact that drainage was so seldom resorted to, and Dr. Martin informed me that for three years previously he had not drained a single case of abdominal section. Upon my return to Dublin I attempted a similar practice, but I was obliged on more than one occasion to reopen the wound and insert a drainage tube. From the time that I got into my new operation room, however, I was able almost entirely to dispense with drainage; but apart from the direct contamination of the wound by the atmosphere is the greater risk that, especially in prolonged operations, the dust deposited from the air upon surrounding objects might contaminate the hands of the operator though aseptic at the commencement. In order to guard myself from misapprehension, I may say here that I do not deny that abdominal sections can be satisfactorily performed in any ordinary room if proper precautions be taken, or that the chief source of danger lies not so much in the atmosphere, as in the almost impossible task of rendering and keeping the hands of the operator and his assistants absolutely aseptic, so that, in spite of all care, accidents do and will occasionally happen even in the best regulated hospitals. But just as in railway traffic every precaution, no matter how costly, is deemed essential, and every disaster is subjected to most careful investigation, so in surgery every means should be employed to render infection as infrequent as possible. Many accidents are due to someone whilst intent upon his work unconsciously touching or laying instruments upon some septic object, or by the introduction of some uncleansed utensil or instrument. It is, therefore, of the first importance that everything within reach should be pure.

PREVENTION OF SEPTIC INFECTION.

In the maternity hospital I found it a much simpler matter to prevent septic infection when the patients were confined in a special labour ward easily cleansed, and where the instruments and utensils were carefully guarded, than when they were delivered in eight different wards distributed over a space which was practically beyond control. So in surgery the place of operation, the number of assistants, instruments and utensils should be so limited as to be thoroughly under control. I have limited my assistants to three, or in exceptional cases four—one to help directly in the performance of the operation, one to administer the anæsthetic, and one to thread needles and hand the instruments. By employing sterilised muslin instead of sponges I have been enabled to dispense with two most dangerous assistants—namely, the

nurses who formerly washed and handed the sponges. The muslin compresses were taken by myself directly out of the can in which they were sterilised, the lid of which was opened and closed at pleasure by a bellows placed under my foot. In order to dispense with the use of blankets the inner room was heated by hot-water pipes to between 70° and 80° F., a temperature which I did not myself find inconvenient, because I wore only a flannel shirt and trousers with a sterilised overall, and I believe that it benefited the patient by sustaining her vital energies and diminishing shock; and on misty days it cleared the atmosphere and lessened the risk of pulmonary complications.

Another point which I think is of much importance in preserving an aseptic condition in an operation room is that no septic case should be admitted into it. To enable this to be attempted there is a second operating room in the Rotunda Hospital, in which such cases as sloughing cancers and myomata, putrid and purulent collections, etc., are operated upon. The importance of this arrangement is that it not only preserves the walls and furniture, but also the instruments and utensils from contamination. It is better and easier to keep out infective matter than to destroy it after it has got in. The equipment of each room was therefore kept distinct. It was of course impossible to absolutely exclude all septic cases; some were only discovered to be so at the time of operation; but even though it be impossible to be absolutely aseptic, let us be as aseptic as we can. The arrangements in the outer room will not detain us very long. It is important that every instrument and appliance which could possibly be required should be within easy reach, and for this purpose they are preserved in a glass case in this outer room. This plan is in every way better than carrying the instruments and appliances to and from the surgeon's residence. In this part of the room are also placed the washhand basins and nurses' sinks. The construction of the former is important: there are two large tip-up basins, which are easily removable for cleansing purposes, with one for corrosive sublimate between them; the watercocks are worked by the foot, and all pipes are exposed. Such basins are much safer than fixed ones with waste pipe and a plug secured by a chain. The traps of the waste pipes and the chains are impossible to clean, and must contaminate any water which is poured into them. I believe that I was the first to introduce treadle action into basins for surgical purposes, and in the maternity hospital their use has been followed by an improvement in the health of the patients. The arrangements for onlookers have met with general approval. Those in the first row stand close against the glass screen with a rail to lean upon. As the operation table is placed close to the other side they are within a foot of the abdominal incision, and can see what is going on as well as the operator himself. Behind them is a platform upon which three more rows of spectators stand, each tier being a foot and a half above the one in front, so that an unobstructed view is obtained. The head of a spectator on the topmost row as he leans forward is only three feet distant from the glass screen. I believe that at least twenty people can obtain a perfect view from this gallery.

I have often been present at operations in other theatres, and as often as not have seen nothing of the operation. On these occasions I have employed my leisure in counting the number of those present who were more fortunate than myself; this I could easily do by the expression of their faces; the intent and earnest gaze of those who could see contrasting strongly with the listless aspect of those who could not. Amongst the latter were unfortunately the greater number of the pupils who were paying for instruction, whose view was not only intercepted by the assistants and others who crowded round the table, but even where this was not the case they were unable by reason of the distance at which they were placed from distinguishing the minutiae of the proceeding. In the Rotunda theatre the pupils are close to the operation and nothing intercepts their view.

PREPARATIONS FOR OPERATION.

When the time for operation is approaching, the patient, who has been prepared in the usual way, is lifted from her bed on to a trolley, and is rolled into a small room opposite the theatre. Whilst she is being anæsthetised, the operator

and assistants prepare themselves and put on sterilised overalls. The patient is then rolled into the outer room, and all coverings having been removed, a light sterilised flannel wrapper is put on, and she is then rolled into the operation room or inner compartment and placed upon the table. The anaesthetist takes his seat at the head of the table, the chief assistant sits at the side opposite to the screen, and the operator sits between the patient's thighs. The sister who threads the needles and hands the instruments, etc., stands behind with a nurse still further in the rear to fetch water, fill and empty basins, and make herself generally useful. Lastly, the door in the glass screen is shut, and whilst the patient's abdomen is being cleansed for the last time, the spectators are admitted.

At the risk of being somewhat discursive, I would here state my opinion that the preparations for an operation and the care of the instruments are most safely entrusted to an intelligent nurse under the supervision of the operator or his male assistants; and she will perform these duties as well as threading needles and handing instruments better than any house-surgeon or resident pupil, however conscientious or well disposed he may be. It is her chief duty in life, and she applies to it all her energies; and, if a well-paid and permanent official, she acquires in the course of years an amount of skill and experience which would be impossible in anyone holding a temporary position. I have never seen so good an assistant in these respects as Frau Horn, Dr. Martin's head nurse in Berlin, and very little inferior to her have been the three nurses who assisted me in the Rotunda. Besides those whom I have already mentioned, one other individual was generally present at my operations; this was the Lady Superintendent, whose sole duty was to see that all went right, and immediately to call attention to anything that went wrong.

ADVANTAGES OF THE GLASS SCREEN.

In concluding these remarks upon the Rotunda Hospital theatre I may sum up what I think are the advantages of its most distinctive feature—the glass screen.

1. It divides the room into two distinct parts, in the first of which are placed the basins, sinks, instrument case, sterilisers, and platform for spectators, all of which are indispensable, but would be difficult to clean with sufficient ease and rapidity, especially where several operations have to be performed in succession. Their absence from the inner compartment enables its furniture to be so simple that it can be thoroughly hosed out in a few minutes.

2. A pure atmosphere, free from draughts and dust and uncontaminated by spectators, is obtained by its complete isolation, its simplicity of construction, and the cleanliness and dampness of its walls. Whilst the high temperature of the inner compartment enables us to dispense with blankets, maintains the patient's vitality, lessens shock, and dissipates mist, the outer compartment is so cool that the spectators, though dressed in their ordinary clothing, suffer no inconvenience.

3. Lastly, it enables the spectators to approach close to the operation without any risk of disturbing the operator or meddling with his arrangements.

PRACTICAL RESULTS.

As to practical results, I may add that, excepting the months of March and April last year, every case operated upon in this theatre, from November, 1895, to the present time, has run a perfectly aseptic course. The design was the work of Mr. Albert E. Murray, architect, and much of the success in carrying out the details was due to Miss Hampson, the Lady Superintendent.

FRENCH UROLOGICAL ASSOCIATION.—The French Urological Association will hold its second meeting in Paris on October 21st and two following days under the presidency of Professor Guyon. The questions proposed for discussion are (1) the operations performed on the testicle and its adnexa for the relief of prostatic hypertrophy (to be introduced by MM. Albarran and Carlier); (2) non-gonococcal urethritis (to be introduced by MM. Eraud and Noguès). The General Secretary is M. Desnos, 31, Rue de Rome, Paris, to whom all communications should be addressed.

MORPHINE HABIT OF LONG STANDING CURED BY BROMIDE POISONING.

By NEIL MACLEOD, M.D. EDIN.,
Shanghai.

ERLENMEYER, in his work on the morphine habit, recommends quick deprivation as the best and most rational method of treatment. He says that there is not the slightest chance of success of treatment in the patient's own home or family; better is a hydropathic establishment or one for nervous diseases, an asylum, or, best of all, one restricted to treatment for this particular ailment. He says, also, that it is entirely wrong to try to lessen the suffering of the period of deprivation by substituting for morphine another drug, for fear of establishing another drug habit.

That it is possible by means of acute bromidism to quickly and permanently obliterate the desire for morphine without the usual subsequent suffering and without creating another drug habit in cases where that drug has been taken for several years in larger than medicinal doses, I leave the following cases to determine.

In 1889 a married lady, then aged 25, suffered from neuralgia, for which she received hypodermic injections of morphine, the habit being continued without break until May, 1896, in spite of several attempts to withdraw the drug slowly. I saw her first in 1892, when I refused to deal with the habit because she would not submit to my conditions of treatment. I saw her occasionally afterwards suffering from diarrhoea, indigestion, sleeplessness, or neuralgia, when treatment was unsatisfactory in consequence of the morphine habit. Early in May, 1896, having been away from Shanghai for some time, she returned suffering from migraine and in a highly irritable nervous state, having reduced the morphine to 10 minims of Magendie's solution (which for her was a very small dose) every four hours. The solution was prepared by her husband, who himself was not free from the habit, and who also prescribed and made up a chloral draught for his wife's sleeplessness. On May 17th I ordered her a 12 ounce bottle containing 12 drachms of sodium bromide, a half ounce to be taken every four hours. On May 18th she was drowsy, and on May 19th I found her so soundly asleep that I could not wake her. The pupils were not contracted, the pulse was 90; temperature, respiration, and skin were normal. The whole bottle and half of a second one had been given. All drugs were then forbidden, and next day she was removed to hospital. I believed the condition to be bromidism, which, however, I had not seen before, and I naturally did not feel satisfied with her surroundings at home, notwithstanding that I had fully warned the husband of his responsibility. Morphine was injected for four days after admission, amounting to 1½ gr. per day, and on May 24th, 25th, and 26th, four 30 gr. doses of sodium bromide, and on May 28th, 30 gr. of chloralamide were given, after which no more drugs were administered. For four days no intellectual, emotional, or volitional effort was observed, and only a little milk was swallowed daily. The patient could not stand or sit, muttered in answer to questions, passed urine and stools in bed. Then followed a period of restlessness, and intellectual and emotional confusion, during which time she asked for nothing and muttered incoherently. Speech at first, like other movements, greatly enfeebled and not co-ordinated, gradually became stronger and more distinct; delusion and illusions of sight at first numerous, lessened, and were not noticed after June 7th; memory past and present, at first all adrift, gradually cleared, being normal two or three days before she left the hospital. The highest pulse was 94, and the temperature once rose to 100°. During the first week in hospital she vomited 5 or 6 times, and did not feel herself till the last week of her stay there. She could not stand without assistance till June 8th, when she began to walk about. She left the hospital on June 17th, feeling quite well, conscious of a blank in her memory, and that she had had delusions. To her own astonishment and that of the sisters (she had been in their charge previously) she had no desire for morphine from the time that she entered the hospital, and I am glad to say it has not yet returned.

This case was, so to speak, cured by mistake, and is all the more interesting that the patient had no desire to be