ANÆSTHESIA IN WAR.¹

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My subject this afternoon is Anaesthesia in War. Dr. S. T. Rowling, who is well known to us all as Senior Anaesthetist at the Leeds Royal Infirmary, is to deal with Anaesthesia in Peace, and his remarks will be of special value as exemplifying his own personal contributions to anaesthesia. I shall confine myself to Anaesthesia in War, as I saw it during nine months with the B.E.F. in France.

There is, of course, no fundamental difference between anaesthesia in peace and in war. In war, however, certain factors arise, which tend to some extent to modify anaesthesia.

The first of these is that in rush periods, patients tend to conform to one type, i.e. wounded men suffering from various degrees of shock, haemorrhage and sepsis, and this in itself tends to limit the choice of anaesthetic. In quiet periods, on the other hand, patients do not conform to one type; one has a variety of types of cases to deal with: the acute and interim appendix, excision of knee cartilages, herniotomies, perforated gastric ulcers, even an occasional thyroidectomy—in fact, all the routine peace time variety of cases of an average military hospital; and as the type of case differs, so does the form of anaesthetic employed.

Apart from the type of case encountered, there are other factors which modify the form of anaesthetic employed. Money is all important in war and the cost of anaesthetic agents and apparatus is not irrelevant, although some of us, I think, are only too prone to overlook it. The money available is not provided by voluntary subscribers as in the case of voluntary hospitals, but by the taxpayer, and is limited. Under these circumstances, one cannot, I think, reasonably expect—so long as there is no loss of efficiency—to be provided with the most expensive anaesthetic agents, forms of gas-oxygen machines, and apparatus generally.

A third factor which may influence the type of anaesthetic selected is the portability of anaesthetic agents and forms of apparatus. Both should be simple and easily portable; ether (in cans) can be carried fairly easily; gas in cylinders not so easily; pentothal is eminently portable. The apparatus should be capable of travelling hundreds of miles without breakage, in ship, train or motor lorry, of being carried from one muddy field to another, and of being used in a flooded tent, on rough uneven ground. At

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least, that was my experience, on occasions, last winter. We were accommodated simply in tents, in fields and orchards, and to start with, our operation theatre was a hospital tent. I remember the first anaesthetic I gave under these conditions was for an acute mastoid. Later on, the operating unit was accommodated in a modern school, but that took some months to accomplish.

As regards personnel we started with one specialist in anaesthetics per 1,200 bedded hospital. Later on, when travelling surgical teams were provided, this was increased to two.

We were provided with most of the usual anaesthetic agents—gas, ether, chloroform, ethyl-chloride, stovaine, percaine (the light variety), novocain and pentothal.

For pre-anaesthetic medication we had atropine, morphine, hyoscine, alopon, alopon with scopolamine and ephedrine. Adrenalin, pituitrin and coramine were available. Cylinders of oxygen and carbon-dioxide were provided.

As regards apparatus in General Hospitals we had the field pattern Boyle’s apparatus for gas-oxygen, gas-oxygen ether, Shipway’s warmed ether apparatus, a Junker bottle, Magill’s endotracheal tubes and laryngoscope, the usual Bellamy Gardner’s ether dropper, Phillip’s airways, Clausen’s harness, Schimmelbusch masks, and Howard Jones’ spinal needles. A simple gas machine with Catlin’s bag was also available.

As for the gas oxygen apparatus provided, the field pattern Boyle is British, it is portable, not I believe very expensive, as gas-oxygen machines go, and in spite of its shortcomings, one managed, on the whole, extremely well.

The Shipway warmed ether apparatus, so far as I saw, was not much used, in spite of its popularity in the last war.

As regards choice of anaesthetic, in my opinion the most generally useful anaesthetic agent in war is gas-oxygen with suitable premedication and minimal ether, if required. Second in place of favour, I would place ether given by the open drop method. Our usual procedure was to give morphine and hyoscine one hour before the operation. Though we had several busy days towards the middle of June, our peak period was the day we gave seventy-one general anaesthetics in the theatre for recently wounded men, mostly with their first dressings still in position; men with wounds of all grades of severity. At this period all C.C.S.s for one reason or another had ceased to function. All these cases were given gas-oxygen, gas-oxygen ether or open ether with suitable premedication. In passing, I may say that by this time the blood transfusion unit had joined us and did excellent work in getting cases into the best possible condition for operation. A pre-operative systolic blood-pressure of 100 mm. of mercury was aimed at, so far as possible, and no effort was spared in order to get operation cases into the best possible condition.

Stimulated by a colleague’s example, I got into the way of using on the
Boyle the soda-lime absorption technique in the administration of gas oxygen, gas-oxygen ether. It certainly economized gas, and this factor was of some importance as latterly we began to be short of gas, and there was then no possibility of getting any more. This technique conserved the body heat to some extent, and may in this way I think have helped to minimize the possibility of shock production. The soda-lime filter was made locally, and we had had the forethought to lay in a fair supply of soda-lime.

Endotracheal methods were invaluable on many occasions. In fact, it was almost routine to pass a Magill's tube. There was at the outset some delay in obtaining these, but later on no difficulty.

As for rectal and spinal anaesthesia, these methods do not hold in war the same place of importance as they do in peace, for obvious reasons. Wounded men resent the preliminary manoeuvres necessitated by these forms of anaesthesia. Spinal anaesthesia is very definitely contra-indicated in patients suffering from shock. Full use, however, was made of spinal anaesthesia in quiet periods in suitable cases.

As regards local anaesthesia, this in wounded men may cause oedema, which in turn favours the growth of organisms, and retards healing. It is, therefore, contra-indicated.

As for intravenous anaesthesia, I think we all found pentothal very useful, for the induction of anaesthesia, for painful dressings and so on. Very little was required, and this had to be used with care if the patient was ill. A word of warning, as it contains sulphur it should not be given to patients receiving sulphanilamide preparations.

In quiet times my colleague was in the habit of giving continuous pentothal for abdominal operations, using about 1.2 grammes for an ordinary appendicectomy. The technique was simple. Under strict asepsis an Edwards’ vein seeker was filled with sterilized normal saline and introduced into a vein in the antecubital fossa. The vein seeker was strapped down on to the arm. A continuous drip glucose-saline infusion was rigged up (height about 3 feet) on the anaesthetic trolley and led into the vein seeker. It was now a simple matter to introduce the pentothal intermittently into the same vein seeker, adding it from time to time to the glucose saline infusion. The results were very satisfactory, both to the patient and the surgeon; adequate relaxation was obtained and the patients liked it.

As regards anaesthetic sequelae, we had no deaths on the table and no case of death which could be directly attributable to the anaesthetic. Pulmonary complications were infrequent, and we had no case of bronchopneumonia, embolism, or massive collapse of the lung. Headache after spinal anaesthetic was not common.

In conclusion, in this brief and I fear inadequate summary, I would emphasize the need for simplicity and portability of apparatus; the same applies to the anaesthetic agents. In rush periods, one has to call upon the occasional anaesthetist, and the less complicated the apparatus
with which he is confronted the happier he will be and the better will be the results. The anaesthetist has to be a man of tact. In addition to metaphorically holding the patient’s hand throughout the ordeal of surgical intervention, he has to satisfy the requirements of the surgeon. I personally am all for progress, but in my experience surgeons as a class are rather conservative, preferring the old well-tried methods of anaesthesia to more novel methods. As one very senior surgeon put it to me, when discussing this very point, “My dear fellow, once you encourage that sort of thing, the anaesthetist begins to think he is more important than the surgeon.”

*Verb. sap.*