This subject has been under consideration for some time, having been first raised in 1931 in a paper by Major Frobisher, R.A.M.C. [1]. He suggested that the packet system should be adopted in the Army. His paper aroused considerable interest, as there would be a great saving in bulky material if the large number of sterilizing drums could be eliminated from the medical mobilization equipment. In peace time these drums are a constant source of recurring expenditure, as damage to the hinges and clasps is very common, and in most hospitals scarcely a week passes without some of these drums having to be sent for repair.

I have often used a packet method of sterilization in stations abroad where drums were not available, the dressings, etc., being simply enveloped in towels or a sheet and sterilized in a high-pressure dressing sterilizer. Many other officers must have tried this system and, with care, satisfactory asepsis has been secured.

The packet method has been given a trial in the Queen Alexandra Military Hospital, Millbank, and at the Cambridge Hospital, Aldershot. Neither of these hospitals was satisfied that the method is completely satisfactory for use in the Army.

The criticisms advanced from the Queen Alexandra Military Hospital were shortly as follows:

(i) The packet method is only suitable for wrapping up small quantities of dressings.
(ii) The packets are unwieldy in the wards and a large table space is required to open and close them.

(iii) Closure of the packets after use is often unsafe, as the tapes, which have possibly touched non-sterile articles, might come in contact with the dressings.

(iv) The method is not so convenient as drums for hospital work, but might serve for active service.

The report from Aldershot was slightly more favourable, but also contained certain criticisms, viz.:

(i) The method is not suitable for use in the operating theatre, but may be useful in wards and on active service.

(ii) It requires more care in use than drums.

(iii) Partially trained or untrained personnel could not safely use the packets.

(iv) The packets are too large for dressing trolleys.

Inquiries showed that the method is not adopted in any of the London civil hospitals. I thought that if it were a satisfactory method and effected a financial saving compared with sterilizing drums and their upkeep, many hospitals would make use of the method. Consequently a letter was sent to the House Governor of the Leeds General Infirmary asking if it was the only method in use there and for particulars of the technique. The House Governor replied that it was the only method in use in the Infirmary and suggested that a representative should visit Leeds to see the procedure. On November 17, 1933, therefore, I visited the General Infirmary, Leeds, and was received by the House Governor and the Senior Surgeon to the Hospital, Mr. H. Collinson, F.R.C.S. The senior sister-in-charge of the operating area had kindly prepared a demonstration of the method and took great pains to describe fully the procedure. The method of using the packets in the wards was also demonstrated by a ward sister, and Mr. Collinson explained many of the details.

**DESCRIPTION OF THE LEEDS METHOD OF PACKET SYSTEM OF STERILIZED DRESSINGS.**

Some of the technique is difficult to describe in words and must be seen to be appreciated.

All packets for the wards and operating rooms are prepared in a special department adjoining the operating area. Four lady nurses are constantly employed in a large room. This room, in addition to tables and benches, has a long range of cupboards with many shelves and close-fitting glass-fronted doors, and also many labelled drawers for storing packets which have been sterilized. No attempt is made to provide large packets containing all that would be required for an operation, such as gowns, towels, dressings, swabs, etc. The principle is to have a large number of small packets; thus gloves are in one small packet, tete cloths in another small packet, one dozen abdominal packs in another. The largest packet con-
sisted of three sheets to cover the patient on the operating table. The packet for the surgeon's preparation is also small. Short coats without sleeves are used, and one of these with a pair of trousers constitutes a packet. Another small packet contains a pair of sleeves.

No large packets are supplied for the wards, the idea being rather to prepare an individual packet for the dressing of one case. Quite a small packet designed for the preparation of a case for operation was demonstrated in the wards.

**HOW THE PACKETS ARE MADE UP.**

The larger packet has a cover consisting of a sheet of jean material lined with a layer of flannelette, the two being stitched all round the edges. The materials to be sterilized are placed in the sheet and are never more numerous than can be amply covered by it.

The method of folding that has been found to be most useful is to turn in the corners to the centre, overlapping slightly, and then to fold the packet once on itself. It is kept closed by being tied all round with a strip of bandage. There are no attached tapes.

For the smaller packets containing swabs and gauze dressing, the pads are rolled up in a piece of flannelette and then enclosed in a jean cover as described, and the corners are turned in and tied up.

**STORAGE.**

The packets for operating room use are kept in the cupboards and drawers mentioned, and the packets required for an operation are withdrawn as necessary.

**METHOD OF USING THE PACKETS IN THE OPERATING ROOM.**

The technique must be seen to be understood, but is shortly as follows:

In the operating room there is a very large semicircular stand with shelves. On the top shelf a series of large sterilized basins is arranged and kept ready for use covered by a sterilized sheet.

When an operation is about to take place the sister opens a packet. She cuts and removes the enclosing bandage, grasps the material with both hands on either side, and by supinating the forearms makes the outer cover with its turned-in corners gape and then decants the contents, in some cases enclosed in an inner wrapper as described, into one of the sterilized bowls. After this the dressings, swabs, etc., in the bowls are only handled by sterilized gloved hands or sterile forceps. When more swabs, etc., are needed, a fresh small packet is opened and decanted into the appropriate bowl.

The largest packet employed contains sheets to cover the patient. Three small sheets are placed in each packet, one having an opening through which the operation is performed.

For the preparation of the surgeon a sterile table is prepared by covering it with sterile towels removed from a packet by forceps; the coat and
trousers, and in some cases linen long boots, are decanted on to the sterile table by the method described.

It will be noted that no packet is opened and then closed again and that no attempt is made to have a series of things, such as towels, sheets, dressings, swabs, etc., made up in one packet.

**STORAGE AND USE IN THEwards.**

Very large enamelled dressing boxes are provided for each ward and the required packets, which are all small and drawn twice daily, are kept in these and withdrawn as required. The sister demonstrated their use. The same method of opening the packet is employed. The bandage is removed, the outside of the material grasped by both hands and the folded-in corners made to gape; the packet is then placed on the dressing table which is quite small and the contents picked out with sterile forceps. It is usual for a fresh packet to be used for every dressing and preparation.

**LENGTH OF TIME KEPT AFTER STERILISATION.**

The wards practically use up their supply daily, but no anxiety is felt about the sterility of the contents of packets which may not be used for several days. In the operating area the sister informed me that three days was the greatest period that a packet was likely to remain before being turned over, but no anxiety would be felt if it remained for a week.

It should be noted that both in the operating area and in the wards the packets are carefully kept under cover from dust, etc.

It should have been mentioned that large cotton bags labelled for wards, etc., are provided; into these all the packets for a ward are placed. Each bag is closed with a draw string and in it the packets are sterilized and then delivered where required.

**SURGICAL OPINION OF THE VALUE OF THE METHOD AT LEEDS.**

The surgeons and sisters are completely satisfied that aseptic surgical conditions are fully ensured by the methods employed. Frequent laboratory tests are employed and are uniformly satisfactory.

**COST OF THE METHOD.**

As drums are never used at Leeds the staff are not in a position to compare the two methods, but a very large quantity of material is required to supply all the packets used and daily replacement of the packet material is necessary.

It appeared to me that the recurring cost may be quite as great as the repair of drums, but the initial capital cost is much less.

**COMPARISON OF THE LEEDS’ METHOD WITH THE PROCEDURE TRIED OUT AT THE QUEEN ALEXANDRA MILITARY HOSPITAL, MILLBANK, AND THE CAMBRIDGE HOSPITAL, ALDERSHOT.**

After visiting Leeds it was at once clear that the trial we conducted did not in any way conform to the practice at Leeds. At London and Aldershot the packets were all too large, and too many different things
were put into one packet. Further, it was assumed that a packet could be employed for a whole series of ward dressings and safely closed again between such dressings. The packets were much more elaborate affairs than the Leeds packets and had attached tapes for tying.

The criticisms on the method are due to these causes and will be obviated if the true Leeds technique is adopted.

Is the method applicable to the Army.

If a method has distinct advantages in war it might be justifiable to adopt it in peace, but no method must be used in war which is not practised in peace.

There is no doubt that an individual surgeon could train his operating staff to use the method safely and successfully.

The success of the method at Leeds depends on the fact that the drum method is never employed. The whole staff of the hospital, probationer nurses, nurses and sisters, have never used any other method and fully realize how these packets are to be handled. This handling is comparable to a laboratory technique which can only be successfully employed by fully trained personnel. In the Army we would be constantly confronted with medical officers and lady nurses drawn from teaching schools where the method has not been tried and who are opposed to it from the first. Unlike a civil hospital, changes of nursing staff in a military hospital are very frequent and in the wards orderlies who are undergoing training and have not yet grasped the full significance of aseptic surgery may have to handle these packets. In these conditions the method would be unlikely to give satisfactory results, and the responsibility of the surgeon would be greatly increased.

If it is decided that the method is not suited for use in peace, it is certainly not suited for use in the field. Here a mixed staff, many of whom had never heard of the method, would certainly fail to secure asepsis and the number of individual packets required would be impossible of attainment. The careful storage of the packets before use, which is practised at Leeds, might not be possible at General Hospitals and Casualty Clearing Stations on active service.

To sum up.

The method is safe in an individual hospital where the staff is permanent and educated up to it from their earliest training.

It is not really suitable for use in the Army with a staff who have been trained in other methods and with many partially trained men working in the wards.

As I pointed out in previous correspondence on this subject, if the method were entirely satisfactory and effected a financial saving, many London hospitals would be using it and it would not be confined to the Leeds General Infirmary.

Reference.