warmed oxygen given by catheter or mask. Evipan intravenously is useful, particularly for sudden severe spasms which stop respiration completely; as also is nembital, $1\frac{1}{2}$ grains by mouth and repeated. Morphine and heroin should be employed sparingly, but are useful at times. Nitrous oxide and oxygen, chloroform, and ether are also occasionally of value, but if spasms are severe they cannot be inhaled. With all sedatives the risks of overdosage have to be weighed against the risks from the disease. If there is moisture in the lungs atropine should be given subcutaneously.

Feeding and General Management

Reflex spasms are excited by external stimuli of all kinds, and these must be reduced to a minimum. Patients should be kept as quiet as possible in a darkened room or at least be screened from others. The bedclothes should be cradled, and all necessary manipulations, such as feeding and the giving of injections, done while the patient is most deeply under the influence of sedatives. In severe cases a sister or orderly should be near the patient all the time. It is important to maintain strength by giving plenty of nourishing fluids and feeds whenever opportunity occurs. Glucose or cane sugar in water or weak lemonade, milky foods; egg and milk, broth, and bovril are all good, and the last two tend to make up any loss of chlorides from excessive sweating. When trismus is severe it is sometimes necessary to extract teeth before feeding is possible, and occasionally feeding by stomach tube is necessary. Avertin is often of great value in relaxing the jaw, and the attempt to feed should be made from one to three hours after the drug has been given. Feeding by rectal drip is also occasionally useful.

On active service the question may arise whether patients should be evacuated. The decision may be a difficult one and, apart from the wound, depends chiefly on the severity of the reflex spasms and the stage which the disease has reached. Patients who have not developed any reflex spasms four days after the onset or whose spasms have almost subsided can usually be moved with safety. Those who are developing them within four days or who are still having severe spasms should stay.

Complications and Prognosis

Pneumonia is a not uncommon and a fatal complication, and, if suspected, sulphapyridine should be given. Retention of urine occasionally occurs, and hyperpyrexia is usually a terminal event. The latter should be treated by antipyretics and tepid sponging. Sequelae of tetanus are rare.

In arriving at a prognosis the factors that have to be considered are: whether there has been active or passive immunization; the severity, degree of infection, and site of the wound; the length of the incubation period and period of onset; the age and physique of the patient; the presence of intercurrent disease or injury, loss of blood, or exhaustion; the severity of reflex spasms; and the conditions under which treatment can be carried out. An incubation period of more than seven days, a period of onset of more than two days, the presence of local tetanus, and a slight wound only, are all in favour of recovery. Other things being equal, the prognosis is better with wounds of the leg than with those of the head, neck, or arm. In war, intercurrent weakness from the severity of the wound itself, from haemorrhage, and from exhaustion has to be weighed against the beneficial effects of active or passive immunization.

- * The 34th annual meeting of the Medical Benevolent Society for the East and North Ridings of the County of York (including the City of York) was held in the rooms of the York Medical Society on Sept. 30, Dr. C. H. Milburn of Harrogate presiding. The treasurer's report showed the society to be in a sound financial position, and it was decided to make further investments in Government securities. Since the last meeting two members had died, and sympathy was expressed with the relatives. One new member was elected. The annual grant to the dependants of an invalid member was renewed. The following officers were elected for the year 1942-3: Dr. M. Jacobs, Hull, President; Dr. Howard Jackman, York, President-Elect; Dr. G. F. Longbotham, Middlesbrough, Vice-President; Dr. D. Matheson Mackay, Hull, Hon. Treasurer; and Dr. W. W. A. Kelly of 92, Micklegate, York, Hon. Secretary, to whom inquiries may be addressed.

SOME OBSERVATIONS ON SENDING ASSISTANCE TO BOMBED TOWNS

BY

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I put forward these observations with some diffidence though they are written dogmatically. Many may be more experienced, but I have not had the good fortune to read their papers on the subject. If this paper provokes a discussion it will have served some useful function. Apologies are offered for the overuse of the "first person singular," but this is a personal report, and the observations and deductions are in no sense official.

In the winter of 1940-1 Bristol received its average share of air raids. I was active in all save one of these and learnt first-hand lessons. As the winter of 1941-2 approached we were all keyed up to face the bombardments that never came. Instead raids were made on smaller neighbouring towns, notably Weston-super-Mare and Bath. It is obviously possible to view a raid on a neighbouring city with considerable detachment. Such vision may be useful, and I had the good fortune to assist in the "good-neighbour policy" in all these raids. In each case we spent part of the time in the "blitzed city" and part of the time organizing in the "rescuing city." This was possible as the raids were repeated on the second night in each town.

On the whole the good-neighbour system worked well, but it is felt that many improvements could be made. I do not propose to detail what was done—this might be invidious—but the following commentary may be of interest. Admittedly some of it is painfully obvious, but most British cities found that it took actual bombs to drive the lessons home!

Communications

It is clearly vital to establish some sort of contact between the city needing rescue and the rescuer. It is true that rescue parties can be sent fully equipped and self-contained to a considerable degree, but usually fresh supplies, relays of helpers, etc., are necessary. As a busy voluntary hospital, heavily worked and with a war-depleted staff, we do not carry supplies sufficient for "self-contained" as opposed to "shuttle or circulating" rescue work. A fully self-contained unit would obviously need rations, a field kitchen, water, etc. None of this is available, nor is it considered desirable, though certain improvements along these lines could be made. In the case of the Weston raid, phone communication with Bristol was good though the line was sadly overworked (raid excitement) and messages were repeated unnecessarily—for example, a request for more sulphapyridine was separately phoned up by four officials.

In the Bath raids communication was bad. (This is written in terms of the hospital personally visited.) I arrived there at 2 p.m. on the day after the first raid. (I was then leading a surgical team under orders from the Group M.O.) We saw cases and operated till 12 midnight, staying at the hospital for the second raid. At 4.45 a.m. casualties were again arriving. Since leaving Bristol we had been unable to contact Bristol or the other Bath hospitals. The sole contact was the visit of a dispatch rider at 4 p.m. on the first day. We had then been there only two hours and were in no position to know what extra help might be needed, as the problem had only just been surveyed—e.g., some 60 casualties in an unfamiliar hospital with facilities for two teams to operate. At that time we were not *au fait* with the laundry position or the drug and dressing position.

At 6 o'clock on the morning of the second raid I returned to Bristol in my own car to obtain further aid. Clearly this was wrong. It should not be necessary to detach a surgeon to act as a dispatch rider. It is now obvious that when the dispatch rider called at 4 p.m., the aid I should have requested was the honour of a further inspection at, say, 10 p.m., when we would have understood the situation better. We should then have known enough to appeal for rations. The large team

I brought was deplorably fed, yet it worked for 24 hours except for a 4-hour break, and most of its members had been up and doing in Bristol for 14 hours previously. Good warm drinks and substantial meals are necessary for the nurses, doctors, and others in such circumstances.

It is suggested that the best system of communication would be as follows:

The Group Officer's nominee (subsequently termed the "Peripheral Group Officer") should visit the bombed city at the earliest possible moment after the raid. He should inform himself of the situation and establish a centre for his messages, probably at the largest hospital, definitely at any hospital able to telephone. He then phones his opposite number in the rescuing city or sends in his dispatch rider (who often could phone from just outside the city, saving time) and makes his wants known. This shuttle service must be kept alive until the work of "the incident" is over. The Central Group Officer can then organize all the help necessary. The Peripheral Group Officer must continually inform himself (not wait for information) how the hospitals in the bombed area are faring and their needs as they arise. For example, the destruction of a laundry at Weston created an immediate laundry problem. I initiated an immediate "lease-lend laundry system," with Bristol doing the wash. A functioning Peripheral Group Officer is in my opinion vital, to avoid overlap and duplication, often multiplication, of rescue services.

When Should Help be Sent?

When a small city is bombed there is no need to wait for a request for help. Surgical help should leave with the Peripheral Group M.O.'s team, the latter to be fully responsible for communication (detailed above). The hospital in the bombed city may be cleverly organized, but it will need help. If it is so staffed that it does not require help in an air raid, then it is over-staffed and is wasteful of man-power, and doctors should be requisitioned from it for military service! The policy of "waiting to be asked" is pernicious. Suitable help courteously offered will always be welcomed. It is not necessary to mention that the bombed cities alluded to asked for help and sensibly used it, and have sent subsequent thanks which were much appreciated. In one city that was helped, on the arrival of the rescuing team the whole resident M.O. staff of the hospital retired to bed—a sensible manoeuvre.

What Type of Help should be Sent?

I have firm views on this subject, and they conflict to some extent with E.M.S. authority as stated in the "Red Book." However, I will venture to dogmatize.

1. The "Shock Troops" Team

The first help to be sent should be strong parties of medical students with a few sensible housemen. These I consider my shock troops—they are "go-anywhere-do-anything men." They will give a blood transfusion, take a blood pressure, shave a head, write notes (vital: I have seldom seen a "General" write a note), put out a small fire, act as stretcher-bearers, give simple anaesthetics, form a minor surgical team, and generally do the ten-thousand-and-one things that "proper doctors" seem to find beneath them. The supreme pull of the big city over the smaller is not in the greater excellence of its consulting staff but in the number of its medical students. Where possible I would include in the shock division that other salt of the earth, an almoner with her clerk. This division, warmly clothed* and well fed, should be on the road within 1½ hours of news of "the incident." This news came in about 3 a.m. when there was a midnight raid 25 miles away, though I am convinced this information could be expedited. The "shock troops team" and the Peripheral Group M.O.'s team can well leave together.

2. Surgical Teams

The surgical teams that seem to be so beloved of the E.M.S. can well leave at a much later hour, say breakfast-time. They are not needed in the first few hours unless the stricken area has no surgeon at all (highly improbable), in which case a surgeon must leave with the shock troops. Most casualties

can well do with a few hours' rest; the few "vitaly urgent" cases can be dealt with by the local surgeons, who, having withstood the night's raid, will appreciate relief at 9 a.m. to see to their own homes, etc., but who do not want relief at 5 a.m. or 6 a.m.

The surgical team should consist of surgeon, assistant, anaesthetist, two nurses with theatre experience, and a sufficient number of medical students. The wise surgeon will pack his own kit; every surgeon will have his own fancy, but in air raids the best surgeon is the one who needs the least tools. I have a passion for taking razors (and a student to hone them) and nail-brushes; experiences of "hair like barbed wire" have developed this taste. I may here cavil at the usual theatre technique. The surgeon's clean washed hands are usually an improvement on the patient's wounds, while the ordinary theatre ritual is fantastically oversafe for a primary amputation or excision of wound edges of, say, a hole in the buttock. It is well to carry goods for one's own comfort—e.g., a theatre suit, gum boots, and a mackintosh. The visiting surgeon who bothers the visited hospital for these things is *not* helping—he's wasting time, energy, and tempers. Ideally, a surgical team should be relieved every 8 to 10 hours, otherwise efficiency will fall off. The provision of relief is the duty of the Peripheral Group M.O., whose job is always to view and review the problem, note how the work is progressing, and contact the centre. The surgeon in these teams should be a good general surgeon.

If one took the E.M.S. "Red Book" too literally the first duty of an M.O. at an E.M.S. receiving hospital apparently would be not to treat the sick but to notify them to someone else! Vide the following extracts:

Page 17, para. 25.—"Whenever a patient with head injuries is admitted to a hospital the Regional Consultant must be informed immediately, if possible by telephone confirmed in writing, unless the patient has been admitted or transferred to a special centre, or has been visited by a neurosurgeon."

Page 15, para. 20.—"Chest wounds, whether admitted direct or from first-aid posts, should not be retained at casualty hospitals, but should be evacuated as soon as possible to one of the special chest centres. If a case is not transferred at once the Regional Consultant must be informed immediately, if possible by telephone as well as in writing. A copy of the notification must also be sent to the Regional Hospital Officer, or in the case of the London Sectors to the D.G.E.M.S. at Whitehall. All penetrating wounds and severe crush injuries of the chest must be notified, but there is no need to do so in the case of surface wounds or simple fractures of the ribs."

Fortunately, so far as my information extends, England is full of doctors who read these regulations with a blind eye or swallow them *cum grano salis*. It is not disputed that they may be right and proper in "quiet periods" in a hospital; certainly they are *de trop* in a blitz period.

3. The Special Technique Team

By "special technique team" I mean those surgeons and assistants whose work requires trained assistants and, maybe, special instruments, etc. These teams may be found in neurosurgery, fractures, thoracic work, burns, and facio-maxillary work. Their use calls for much thought. I do not deny that many difficulties arise. There are various possibilities, and it is well to discuss them. The "quiet period" duties of these teams are clearly those of (i) attendance to routine duties; (ii) dissemination of information to their colleagues who practise in a more general way; (iii) holding demonstrations of technique, etc.

Their duties in a raid are less easily defined. Three possibilities emerge: (A) Should they remain at their base ready to deal with what comes to hand? (B) Should they await the summons of the Peripheral Group M.O.? (C) Should they tour the hospitals in the bombed city seeking their wounded amid the debacle? It is assumed that all these "specialists" cannot do both A and B. If they can, then there are far too many of these single-minded gentlemen, and they should be drafted elsewhere! In fact, the super-specialists should be organized, like the National Fire Service, on a drafting basis.

Possibility A is not ideal. In practice the patient does not often reach the right centre, and certainly not unharmed.

* Battle dress for shock troops is old clothes, a torch, pencil and pad, and a pair of dressing scissors.

With regard to possibility B, it is argued that the Peripheral Group M.O. will not be properly advised when to call for the special technique team and that delay may thus occur. This is surely a matter for education. (My own criterion of the "F.R.C.S. standard" is a "young surgeon who knows when he doesn't know.")

The third possibility (C), the "touring the battle-front" idea, raises interesting points—e.g., Who should tour? What should he take? The practice of the consultant touring alone is almost valueless. If he gives a little advice in the excitement of an air raid it may or may not get properly acted upon. If the consultant himself rolls up his sleeves and actually works, then he is working in strange surroundings minus his subordinates and cannot do the case justice. Further, he is likely to have a case that takes a long time, while the theatre door is crowded with fuming general surgeons waiting to lop off a leg or excise a wound.

In this connexion I put up two workable ideas for criticism.

(a) Let the consultant tour alone, *but* let him take an ambulance with him and let him seize the suitably wounded and *there and then* pack them off to his centre. Of course this will mean that the early bird will get the worm, for I must confess to having seen cases of multiple injury from air raids.* It is clear that the consultant cannot be "selecting winners" on the spot and curing them at the centre at one and the same time. It is assumed, however, that the rest of his team remain at the base, and in the absence of the General they carry on. If they are unable to act alone another consultant must move to the centre or base as its own consultant moves to the periphery.

(b) The consultant arrives fully equipped with his own team and tools and does the work on the spot. "Fully equipped," then, should mean "everything," or almost everything, the battle area supplying only a room. This method is expensive and it is slow. The necessary three-ton lorries would have to leave at the start of the incident. If their personnel was dispersed at all it would take a long time to collect. I once made plans with Brigadier Cairns for the Oxford Neurosurgical Service to relieve Bristol in this manner. We never tried the experiment, but my opinion is that if from Bristol an S.O.S. was sent at 12 midnight the lorries with relief might roll in about 12 noon the following day, probably later. Say 3 hours to get an S.O.S. out, 4 hours to collect and feed the team (one on week-end leave, one ill, one at a new address, etc.), and 4 to 6 hours on the road. Anyway, the E.M.S. has not provided fully equipped civilian teams in the sense alluded to—at least not in my region.

Probably choice *a* above is the better in view of present conditions. Choice *b* is certainly worth trial, and could be experimented with in one or two regions, and data collected.

4. Nursing Relief

This is important, and requires nice judgment and execution. A two-nights-running air raid is a heavy test of the usually busy, usually under-nursed general hospital. If to the admission of numbers of casualties be added minor bomb damage (windows blown in, no black-out, etc.) and noisy excitement in the daytime precluding rest, then the strain on the night nurses is heavy. We tried the experiment of exchanging units of nurses between the central city and the bombed town, thus providing a "quiet night." This needs much arranging and nice timing when all hospitals are working full out with minimal staffs. Two experiences in practice are related, and are instructive:

Twenty nurses were sent at 9 p.m. to the Weston General Hospital after the second night's raid (obviously no one knew if a third night's raid would occur). These nurses were courteously received and were distributed among the wards; during the night the local nurses were each given 4 hours off duty and their work thus lightened. Had a raid occurred the augmented staff could easily have shared the work. (A similar exchange of house-surgeons is desirable.) A similar party of 20 nurses were sent to another hospital, where the matron had already been advised to expect them. They were met on arrival, told they were not wanted, and sent back crestfallen

* In these cases the zealous resident must notify (see "Red Book") three or four different consultant advisers and later divide the single patient among three or four different hospital centres. In the interests of logic the E.M.S. should appoint a multiple-injuries specialist and have done with it.

to Bristol. What a lack of imagination and tact! The hospital in question did not even notify this action to the A.R.P. organizer, with the result that next day a bus was sent to fetch back nurses who had been returned the night before!

These contrary experiences merely confirm the need for good planning.

Summary

The salient features of the above observations may be summarized in the form of a time-table, thus:

Time	Duties of Central Bureau Officer at "University City"
Say 12 midnight	Incidents at Blankville (It is assumed that Blankville is 1 hour away by ordinary car)
00.30 hours	Notification received at "University City" of Blankville's blitz Immediate summoning of shock troops and Peripheral Group M.O.'s unit. Consideration: "Has Blankville surgeons enough or should a surgeon be sent now?"
02.30 hours	Departure of Peripheral Group M.O. and shock troops, all fed, warm, transport fixed, etc.
03.00 hours	Warn special consultants and general teams to stand by for 8 hours
04.00 hours	(Depending on communications available to receive messages from Blankville.) Assess the degree of help which may be necessary
05.30 hours	Dispatch surgical relief teams <i>quantum sufficit</i> . Begin to plan for their relief S.O.S. N.B.—Information should be arriving constantly from the Peripheral Group M.O.
08.30 hours	Arrange for evacuation of beds in Blankville S.O.S.
09.00 hours	[And so on, depending on the seriousness of the air raid.]

PROPOSED NEW MEDICAL SCHOOL FOR LONDON

FOUNDED ON L.C.C. SERVICES

The establishment of an undergraduate medical school founded on the hospital services of the London County Council—which are by far the most comprehensive in the country and perhaps in the world—is proposed in a report which has been presented to the Council by its General Purposes Committee. The report is in the form of a statement of evidence to be given by the Council to the Interdepartmental Committee on Medical Schools recently set up by the Minister of Health and the Secretary of State for Scotland under the chairmanship of Mr. W. M. Goodenough.

The new school would be established at one of the L.C.C.'s larger general hospitals and would utilize other hospitals and institutions as required. It is assumed that it would become an internal school of the University of London, which, in agreement with the Council, would provide the professional and teaching staffs. The arrangement would be similar to that obtaining at present between the British Postgraduate Medical School and the L.C.C. Alternatively, the Council itself might be responsible for the general direction of the school, as in the case of the school for teaching in psychiatry attached to Maudsley Hospital. It is claimed that the experience which the L.C.C. has gained during the last 7 years in the case of the British Postgraduate Medical School (in which it has satisfactorily met any necessary modifications in the administration of Hammersmith Hospital) should be of great value in dealing with any new project on these lines. Any arrangement which the Council would make to extend medical education would be open to women students equally with men. On the financial side the Council would expect to be treated by the Government no less favourably than the voluntary hospitals and present medical schools.

The L.C.C.'s interest in medical education flows from its position as the major health authority for London, from the fact that it is the largest civilian employer of medical staff in the country, and from the facilities which its hospitals, numbering about 100, and its health services afford for a complete medical education. For some years past it has provided for the clinical teaching of undergraduate medical students by the affiliation of its general hospitals with voluntary teaching hospitals for teaching in obstetrics, fevers, psychiatry, venereal diseases, and other subjects. Up to the outbreak of war 11 of the medical schools were linked with 16 of the Council's "acute" general hospitals, in which classes and demonstrations were held, conducted by the resident medical staff, the Council's consulting staff, or members of the teaching staff of the students' medical school. Instruction in obstetrics has already been given