MEDICAL HISTORY OF AN ACTION.

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The administration of an independent, highly mobile force always presents medical problems of a peculiarly difficult nature. When a force such as this has no lines of communication, is unable to evacuate its casualties, is forced on the defensive in unknown terrain and has to contend with an inadequate water supply and insanitary conditions, the burden thrown on its medical services becomes intensified a thousand-fold.

It is proposed to relate in the following account how a force confronted with an almost discouraging combination of the above-mentioned factors succeeded not only in evacuating a reasonably high percentage of its wounded but also in keeping up the morale and effective fighting strength of its troops to a high degree.

TACTICAL CONSIDERATIONS.

A mixed force of British, Gurkha and Indian troops, operating in a wild, mountainous tract on the Assam-Burma border, were ordered forward to intercept, delay and if possible divert the movements of a superior Japanese column which was advancing to attack an important base. The choice of a locale for a defensive action was limited in view of the unsuitable nature of the country, mountain and jungle, and in the unanticipated speed of the enemy's advance. The time factor made it necessary to choose as the final site a village on a small plateau, a position where the great disadvantage, the lack of water, was immediately made apparent. The officer commanding the force was aware of this but was assured by wireless communication from the base that the deficiency would be made up by an adequate supply of water dropped in parachute containers. The force had scarcely moved into position and had just commenced to dig in when strong Japanese patrols cut across the L.o.C. and the action began.

Our air superiority in this sector was complete and unchallenged and this enabled water, food, ammunition and medical stores to be brought in by parachute air supply.

It is interesting to give some account of the type of troops employed. These, in the main, were hand-picked, highly specialized and of a physique and fitness well above the average. They were accustomed to taking unusual risks and were fully prepared from the beginning of their training to fight in isolated positions behind the enemy lines. As a result of this the morale was uniformly good and the reliance which these troops placed in each other remarkably high.

MEDICAL PERSONNEL AND EQUIPMENT.

The total medical personnel at the disposal of the force consisted of sixty mixed British and Indian other ranks and seven medical officers, two of whom were R.M.O.s. In effect there were two sections and the skeleton H.Q. of a specialized light field ambulance with the addition of a surgical team consisting of a surgical specialist, anesthetist and six other ranks. The equipment was of a type suited to the requirements of such a mission and all the essential materials could be carried in man-packs with the aid of Everest carriers. Concessions to additional bulk in the form of mule-packs were made for extra supplies of Cellona plaster, blood plasma and glucose-saline and a collapsible operating table of the air-borne pattern.

MEDICAL ARRANGEMENTS.

The area to be defended, termed a "box," had a perimeter a mile long and this did not enclose any of the local water points. From the first it was understood that water had to be...
carefully rationed and a reserve was set aside for the use of the surgical team and the needs of the M.D.S.

Shallow latrines were dug on the perimeter and the proper use of these strictly enforced.

As far as was compatible with fighting efficiency, anti-malarial precautions were taken but the high situation of the box and the extremes of temperature markedly diminished the risks of malaria. Chlorination of the available water was done in bulk and in small quantities by the use of water-sterilizing outfits. Later on the air supply of fresh water made this precaution unnecessary. The diet was adequate in bulk and was made up of tinned food-stuffs and parachute-type rations. Fresh meat and vegetables were unprocured but there was a plentiful supply of vitamin tablets. When all these conditions had been appreciated a disposition was made of the medical resources for the reception and treatment of battle casualties.

Four R.A.P.s were located at strategical points just within the perimeter and the rest of the medical personnel was used for bearing and at the central dressing station, which comprised a large reception area, an operating theatre and deep trenches for the protection of the wounded. The immediate requirements were protection from bullets and shrapnel fragments which came profusely and indiscriminately from all directions inside and outside the perimeter, and shelter from the torrential rain which threatened to wash out all the most strenuous efforts of the ambulance sepoys at trench-digging. The most important task, an operating theatre, was dug out of the mud, a pit some 8 feet square and 5 feet in depth. It was buttressed by sand-bags and cushions from the ends of parachute containers. The roof was constructed of bamboo, tarpaulins and earth and the walls were lined with dark coloured parachute silk in order that lights could be used for night work. This was all done under heavy enemy fire whilst the number of severe casualties awaiting operation was gradually mounting.

**MEDICAL ADMISSIONS.**

At the beginning of the action, medical admissions were very few and consisted mostly of cases of simple diarrhoea and of fever of two days' duration responding satisfactorily to rest, fluid diet and antipyretics. Few of the troops had been on suppressive mepacrine but there was no undue evidence of malaria. There were two cases of ascariasis and these received carbon-tetrachloride. Gastro-enteritis and dyspepsias were not uncommon but these could be attributed to diet and other known factors and were easily cured.

**BATTLE CASUALTIES.**

All of the wounded within the perimeter were admitted to the central dressing station and an immediate attempt was made to assess the degree of priority for resuscitation and operation. The majority of wounds were caused by small calibre bullets (0.256 inch) from rifles and automatic weapons and cast-iron grenade fragments and shrapnel from H.E. shells (75 mm.), and also bomb fragments from 2 inch and 3 inch mortars. There were very few cases of bayonet or sword wounds. In spite of the fact that few of the troops wore steel helmets, preferring either Gurkha felt hats of double thickness or cap comforters, there was a surprisingly small percentage (approx. 5 per cent) of head wounds and these, when they did occur, were located generally below the protection line of the steel helmet, British pattern.

Approximately 60 per cent of the total number of the wounds inflicted were in the upper limbs, chest and throat and the remainder of the injuries were confined to the lower limbs. Of the casualties brought in only two had sustained perforating wounds of the abdomen and both these exhibited a severe degree of traumatic shock.

The treatment of all these cases was based on the principle of as little surgical interference as possible, for the unsuitable circumstances made it essential to treat first and foremost the shock and to get the patients into a position of comparative protection from a blanket of fire which covered the dressing station and its approaches. Twenty major surgical operations were performed either to arrest excessive hemorrhage, to explore wounds which endangered life or to immobilize compound fractures of the limbs with severe destruction of tissues.
Most of these were safely evacuated and showed satisfactory progress. The anaesthetic used in all cases was intravenous pentothal sodium for rapid induction followed by chloroform. This procedure, as has been demonstrated before on active service, proved to be efficient and produced no noticeably marked after-effects.

The comparatively small number of operations was due to the fact that, at all times, everything conspired to make the task of the surgeon difficult. Rain flooded the operating dug-out and washed instrument sterilizers and dressings into a mire of tenacious mud. Bomb fragments piercing the walls of the dug-out made any but a crouching or sitting position dangerous. Light was available from electric torches, head lamps and hurricane lamps and at night only life-saving operations were attempted. The insufficient supplies of water reduced scrubbing-up and sterilization to a minimum and at one time the surgeon was forced to wash up in a mixture of Mist, Expect, Stim. and Mist. Kaolin Co.

In general, the treatment of the less severe wounds was limited to debridement, the extraction of fragments, packing with sulphanilamide powder and sterile vaseline gauze and immobilization with Kramer splinting and Cellona plaster.

One unwelcome discovery was the presence of phosphorus burns due to Japanese shells. These were extremely painful and, as there was only a negligible amount of copper sulphate in the stores, recourse had to be made to any forms of alkali available. This treatment appeared to give some comfort and allayed the pain and the concomitant anxiety.

The outstanding therapeutic success of the whole action was the invaluable and often dramatic use of blood plasma and glucose saline. Only small stores of these were carried forward and these were further decreased by loss and enemy action. A total of eighteen pints of blood plasma and six pints of glucose saline was used with the maximum of effect. The criteria for their use were severe haemorrhage, the probable prognosis of the patient and the value of any particular man to his unit. The excellence of the giving-sets lay in that the whole apparatus could be easily and swiftly set up under the worst of conditions, with no other aid except a bamboo pole stuck in the ground to suspend the bottle of fluid. And, indeed, intravenous fluids were given in slit trenches under heavy fire and in the open at night with only the faintest glimmer of light from a shaded torch. The value of such treatment may be assessed from the record of two officers who, originally wounded severely in the face and throat with great loss of blood, were after transfusion and rest able to recover sufficiently to perform noteworthy acts of endurance and heroism.

**Progress of the Action.**

On the sixth day of the battle a survey was taken of the tactical situation. Each day the enemy was receiving strong reinforcements and was mounting a heavier offensive. It was apparent that the perimeter would have to be shortened. The increasing number of casualties was taxing all the resources of the Field Ambulance as it was becoming harder to find any accommodation for the wounded who were already packing the trenches. A breach in the outer perimeter had imperilled the safety of the dressing station and it was necessary to remove all the wounded to a slightly more protected position on the further slope of the hill and to find a new operating theatre. Morale was still high but the sight of the wounded lying unprotected over the area of the inner defences was bound to have a depressing effect on the remaining combatants and the thickening up of the troops on the ground made the possibility of injury from shrapnel more likely. Water as usual was a problem and, on the last day, some of the wounded were given glucose saline to drink. This was not unpalatable.

The area of the box was becoming too small to ensure that adequate supplies could be dropped from the air and one was forced to see medical stores and food being dropped well behind the enemy lines.

The object of the force had been satisfactorily accomplished and, on the evening of the sixth day it was decided to disengage the enemy, evacuate the wounded and withdraw in good fighting formation from a position which had become untenable. The S.M.O. was given two hours in which to prepare the casualties for an arduous trek across country, involving
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a journey of at least 40 miles and hand-carriage for stretcher cases through jungle, along river valleys and over narrow, steep mountain passes.

It was at this juncture that the S.M.O. had to make his most critical decisions. It was, to be reasonably assumed from previous experience and from the knowledge that their own L.o.C were being threatened that the Japanese would waste no undue consideration on the wounded or respect the Red Cross. It was also appreciated that each man of our force was a specialist who had received a long and expensive training and that his loss to his unit as a P.O.W. would be irreplaceable. Therefore it was decided to evacuate as many of the wounded as could be got away. The walking wounded could move, however slowly, steadily forward under a protective screen of fit troops. With the stretcher cases the implications were more serious. It was obvious that not all of them could be evacuated because the number of bearers required would seriously reduce and impair the fighting strength of the column. Some of the cases were so badly wounded that it was certain they would not survive the hardships the journey entailed. The S.M.O., then, had to consider each case carefully casting aside all personal considerations. Would the man survive the journey? What was his probable prognosis and future ability as a combatant? Was he a key-man and essential to the future reorganization of his unit?

These decisions were all rapidly made, six bearers assigned to each stretcher case and, after certain medical arrangements had been made for the wounded who were remaining, these were left as comfortable as circumstances permitted. The rest of the equipment was destroyed. The small stores of food and water were distributed and, in the late hours of the sixth evening, the long line of wounded and its escort passed out through the perimeter under a covering fire from mountain guns and mortars and successfully negotiated the weakest part of the enemy's surrounding lines.

ADDITIONAL MEDICAL NOTE ON WAR HYSTERIA.

During the period in the box there had been very few cases reporting sick and it is interesting to record that there were only two well substantiated incidents of war hysteria, one of hysterical aphonia and deafness and the other of extreme apathy, both occurring in auxiliary troops. The remarkable freedom from any of these hysterical conditions in a situation likely to produce them may probably be attributed to the initial training and good morale of the troops, and to the general appreciation from the beginning that under no circumstances could there be any evacuation from a precarious position, a predicament common to all. Both these cases, together with three others, who were brought in shocked and complaining of being struck by lightning in a tropical storm, were able to be returned to their units after rest and suitable psychotherapy.

MEDICAL ASPECTS OF THE ESCAPE PERIOD.

The column leaving the box was confronted with many grave problems. There was at all times the probability of Japanese ambush and the necessity for evading the enemy made it advisable to split up into small parties, each containing its quota of wounded. Heavy personal equipment was discarded, together with blankets and ground-sheets, and only weapons, water-bottles, food and ammunition were carried. The march was made on a rough compass bearing without any exact knowledge of the speed of the enemy's progress along the main roads. This meant travelling across country over a distance of at least 40 miles, a journey which was extended in the case of some parties of wounded to 75 miles. Where water was plentiful in the river valleys, there was the likelihood of enemy ambush, where food was procurable in the jungle and villages, the Japanese fired the surrounding areas and attempted to cover the avenues of escape.

Diet varied from dry biscuits, roots, flower petals, yams and rice to fresh peas, sugar cane, bananas and roast wild pig. In the beginning, most of the men suffered from lack of sleep, dehydration and accumulated nervous strain. To the wounded this period was an ordeal...
where the discomfort, sultry heat, pain and thirst could only be counteracted by an overwhelming determination to get back to the Base.

The force reassembled at the Base after isolated parties had taken four to ten days to complete the journey and it was found that nearly all of these troops, wounded and fit, who had originally left the box had arrived safe and well.

LESSONS LEARNT.

The experiences of this action brought out certain points which it may be useful to recapitulate in view of future missions of this nature.

1) Elaborate medical equipment is unnecessary. Everything that is needed should be capable of being carried in man-packs, with the help of Everest carriers. Light collapsible stretchers of the airborne type were found to be unsuitable for heavy work but carrying sheets materially proved their worth where ordinary Service stretchers were few or could not be used.

2) As many tarpaulins as can be conveniently carried should be included in the equipment. These serve many useful purposes, but were chiefly employed in erecting temporary shelters for the wounded.

3) The bulk of the medical stores carried should be made up of previously prepared sterile dressings, sulphonilamide powder, Cellona plaster, Kramer splinting, tubonic ampoules of morphia, Elastoplast and adhesive plaster and, if possible, occlusive dressings.

4) Plasma and glucose-saline were absolutely invaluable and were easy to give. The extra weight and bulk were more than compensated for by the dramatic results achieved from their use.

5) Efficient lighting is essential, and an increased issue of electric batteries is needed. Headlamps worked very well but limited the effective area of surgical operation, where no other light was available.

6) During the escape period, it was effectively brought to notice that emergency packs should be prepared for such eventualities.

Suggestions for such a pack would have as a basis an extra water-bottle, iron rations or compressed fruits such as dates and raisins, rations of the American "K" type, chocolate, glucose "D" or barley sugar, an extra supply of water-sterilizing tablets, and fruit-drops or chewing-gum. As an added stimulant, benzedrine tablets would be useful where just that extra incentive is needed to overcome the exhaustion of a prolonged forced march.

CONCLUSION.

It would be impracticable to describe in full all the medical aspects of the foregoing action, but there are certain conclusions to be drawn. Firstly, the powers of recuperation of a wounded soldier can never be over-estimated and, secondly, that the most skilled surgical treatment is only a minor factor compared with the will of the patient to survive.

The endurance, the persistence of the offensive spirit, the boundless courage of the wounded will find wider publicity in official citations and journals, but it is gratifying to know that the expression of these qualities in some of the cases was only made possible by the prompt and effective use of plasma and sulphanilamide.