• An indirect result of this step, one that many of us would welcome, would be the influence which a professorial department of social medicine would bring to bear not only on research in its own subject but on the medical curriculum. If improved public health is the aim of our health services it is essential that the general practitioner be enlisted in the ranks of the social medicine army, and for that reason alone his training must in some measure, and in much greater measure than it is to-day, be directed to that end. With him, in his daily round, lies the opportunity of observing and assessing the evidence of malnutrition, of overstrain, of hygienic ignorance, of dental neglect, of psychological maladjustment, and of many other defects arising largely out of our social system. To him also is given the opportunity, by reason of his intimate relations with his clients, of educating the public in all matters of health and sickness. With ready access to a centre of social medicine to which he could bring both his observations and his problems, and where the latter would be the subject of intensive study and research, the practitioner might well find himself, to quote the apt words of our chairman, Sir Robert McCarrison, engaged in "piloting the ship safely to port instead of spending the greater part of his time in salvaging wrecks."

At this juncture it would be impossible as well as unwise to attempt a description of the accommodation, the equipment, and the staff required by the head of a department of social medicine. It is inevitable, and indeed desirable, that these should be determined by the interest of the individual professor or director in one or more of the innumerable problems open to him in the field of his choice.

Thus, it may be that in one department of social medicine the personal bias of its head may be in the direction of nutrition and the physiological and the biochemical problems with which that subject is bound up; in another his chief interest may lie in genetics and its bearing on eugenics; and in a third his predilection may lead him to investigate the statistical aspects of disability. In each, however, some member of the staff should be responsible for collating information from the social field and for co-ordinating the activities of the social services already in existence and carrying out valuable work. I envisage close collaboration of this department with such auxiliary services as those provided by hospital almoners, district nurses, and health visitors. In effect, departments of social medicine should play a prominent part in that co-ordination of health services, of voluntary or local authority origin, which seems to be the accepted policy of post-war planning.

Conclusions

To sum up my conception of the part to be played by recognized centres of social medicine, I would describe them as destined to fulfil the following needs: (1) To promote research in a subject of vital importance to the health of the nation hitherto inadequately explored. (2) To reorientate the aims of the medical curriculum in such a direction that the doctor of the future will be trained not only to fight disease but to be an architect of personal and public health. (3) To organize post-graduate training in social medicine. (4) To co-ordinate and guide the activities of social and health services already established or to be established in the future.

Owing to some statements that there is so acute a shortage of health visitors, especially in Lancashire and Yorkshire, as to justify the appointment (in four towns already) of unqualified persons, the joint consultative committee of institutions for the training of health visitors has conducted a survey. The number of persons who took the health visitor's certificate in 1941—245—was certainly lower than in the immediately preceding years, but was almost equal to the average of the ten years 1928-37. From the figures of those preparing to take the examination in 1942, the early months of the present year may yield another 195. Local authorities with unfilled vacancies have been circularized, but only 22 still wished to fill vacancies of long standing, and half of these were offering salary scales with a maximum of less than £250 a year. Seven of these 22 areas are either on the East Coast or the Thames estuary. The conclusion is that although there has been some reduction in new entrants since 1938, there is no widespread or acute shortage, and no justification for "dilution." Difficulties are due to inadequate salaries and other unattractive conditions, which were operating even before the war.

War Surgery of the Extremities

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

THE MANAGEMENT OF BURNS

BY

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Burns were originally divided by Dupuytren into six degrees. A first-degree burn caused erythema, a second-degree burn vesication, and a third-degree burn affected the whole dermis. The remaining degrees affected successively the subcutaneous tissue, the muscle, and the whole limb. As treatment and prognosis are the same for each of Dupuytren's last four degrees, no purpose is served by separating them, and nowadays any burn which affects the dermis or penetrates more deeply is known as a third-degree burn.

Cause of Shock

Let us first consider the effect of a burn on the patient as a whole. Within a few seconds or a few hours he may suffer from "shock." I have the good fortune to lunch and sup daily with a scientist who has studied "shock" perhaps as closely as any man living. Every time I say to him, "Tell me, G—, are you yet able to inform me what 'shock' is?" he shakes his head sadly and says, "No." He then says that he comes across patients whom we surgeons tell him are "shocked" and in whom he finds the greatest diversity of physical signs. Some are pale, some are blue, some are euphoric, some apathetic. Most have a low blood pressure, some have a normal blood pressure, and others have a high blood pressure. In most the pulse rate is rapid, in a few it is slow. Some appear to be suffering predominantly from fright or from cold, others from blood loss, and yet others from a mixture of these or from none of them. This state of affairs is the greatest stimulus to the research worker, but must be a source of perplexity to the clinician. As I possess all the qualifications for stepping in where angels fear to tread, I will give you a definition of "shock" which will at least enable us to understand each other. "Shock" is the general reaction of a patient to nociceptive stimuli of a physical, chemical, thermal, or psychological nature. The patient usually feels ill; his skin temperature is usually low, his pulse rate rapid, and his blood pressure below normal. I suppose that others have dealt fully with the theoretical aspects of shock, but I should like briefly to recapitulate some of the theories as to its causation and see how these fit in with our clinical experience.

Crile first suggested that shock was due to nerve impulses from the site of the injury, and he based his views on the effects of nerve section in the traumatized limbs of experimental animals. More recently the late Major O'Shaughnessy has revived this theory, following the results of his cross-circulation experiments. We, as clinicians, are unable to appraise these experimental findings, but we do know that any increase in the nociceptive stimuli to a wounded or burnt patient aggravates his shock. We know that these patients must be moved with the care and gentleness accorded to a piece of Dresden china, and that, if possible, it is better not to move them at all. We know, too, that morphine in full doses is our greatest pharmacological ally. In burnt patients the use of sedatives is so important that it is necessary to have a clear idea of the dosage to be given to every class of patient, and the accompanying table should be memorized.

Dale and Laidlaw later propounded the toxic theory of shock. According to them a histamine-like substance was liberated from the site of the trauma which, being absorbed into the blood stream, brought about the changes described as shock. This theory has a bearing on the value of the tourniquet for traumatized limbs; but, in regard to burns, the absorption of toxic products assumes greater importance at a later stage when the

effects of shock have been overcome. Some of the evidence for the toxic theory was based on the protection from shock afforded by a tourniquet. It was assumed that the tourniquet prevented these noxious products from reaching the circulation, but it was Blalock who pointed out that in order to provide

Table showing Dosage of Sedatives for Cases of Burns

	Age	Drug	Dose
Children	1 month	Tinct. camph. co.	℥ iii
	2 months	" "	℥ vi
	3 "	" "	℥ x
	6 "	Tinct. opii	℥ i
	1 year	" "	℥ iii
	Over 1 year	" "	℥ ii for each year
Adults	12-20 years	Tinct. opii	℥ xxx
	Over 20—		
	Men	I.M.H.	gr. $\frac{1}{2}$ — $\frac{1}{4}$
	Women	"	gr. $\frac{1}{4}$ — $\frac{1}{8}$

satisfactory protection from shock it was necessary to raise the pressure in the tourniquet to arterial tension. Had the toxic theory been adequate to explain the phenomenon of shock, then a tourniquet raised only to venous tension should have been sufficient. Manifestly other factors were at work, and from these and further observations the theory of fluid loss was born.

Treatment of Shock

The practical application of this theory is obvious. Patients suffering from shock are given fluids. Unless contraindications exist, such as suspected abdominal injury, then fluid is best given in the form of hot sweetened tea. But the amount that can be taken in this way may not be sufficient in a severely shocked patient. How are we to tell whether parenteral methods of fluid administration are required? With all the vagaries of the clinical picture of shock, perhaps the most constant is the fall in blood pressure. As a rough general rule we may say that if the systolic blood pressure is below 90 mm. Hg then parenteral fluid is required. What fluid should be given? For the first time we can be thankful that we are dealing with burns. In cases of shock from other causes the problem is generally complicated by haemorrhage, and the question as to the fluid is a very difficult one. In burns the fluid lost is plasma, and so it is plasma (or its twin brother, serum) which must be supplied. This conclusion satisfactorily resolves the next question. How are we to give it? Plasma cannot be given—at least not to my knowledge with any degree of satisfaction—subcutaneously, intramuscularly, or by the rectum, and so it is put into a vein. How much are we to give and how quickly should we give it? As the fluid lost is plasma the effect of this loss is to cause a concentration of the blood corpuscles in the circulation and a rise in the haemoglobin level. This increased haemoglobin percentage, then, is a measure of the amount of plasma lost and an indication as to the amount of plasma required. These relations have been worked out in a manner which is to me quite incomprehensible and involves the use of those tiresome and exacting characters x and y . However, from these calculations we obtain results which are eminently satisfactory in practice. Roughly, if the haemoglobin is 125%, 500 c.cm. of plasma is required, and if the haemoglobin is 145% a litre of plasma is necessary. Intermediate values for the haemoglobin percentage can readily be interpolated. The first 500 c.cm. should be run into the vein in about ten minutes, and succeeding amounts may be given slowly by the drip method at the rate of about 500 c.cm. every two hours, or in cases of extreme urgency as rapidly as the first 500 c.cm. The intravenous infusion is stopped as soon as the haemoglobin percentage and blood pressure have returned to normal. If plasma or serum is not available, gum saline makes an effective substitute.

Because fluid is lost from the circulation and the concentration of the corpuscles rises, these latter may become choked in the capillaries and the oxygenation of the tissues suffers. Theoretically, therefore, oxygen should be given to shocked patients by some such effective means as the Tudor Edwards spectacles or the B.L.B. mask at a rate of about 4 litres a minute. Many authorities have satisfied themselves as to the efficacy of this measure in practice, but I have not been impressed with oxygen therapy in shocked patients. Suprarenal

extract in the form of desoxycorticosterone in 5-mg. doses has a few advocates, but I have had no personal experience of this preparation.

To sum up, the severely shocked patient is put into a bed already warmed by an electric cradle and is covered with warm blankets. The foot of the bed is raised so that the circulation to vital centres in the brain does not have to compete with the effects of gravity. Full doses of morphine are prescribed and fluids are administered according to the plan outlined above. As soon as shock is overcome, as shown by a restoration to normal of the blood pressure and pulse rate and by a recovery of surface temperature at the nose and ears, the patient is taken to the theatre and the burns are dealt with as described later.

Toxaemia

If the above measures are taken, shock is usually overcome within six hours. Persistence of shock for longer than this period is generally fatal, and we can say that by 24 hours shock will have been exorcised or the patient will have succumbed. From 24 to 48 hours after the receipt of a burn, however, another syndrome may make its appearance. This syndrome is known as acute toxaemia because it is thought to be due to the elaboration of toxins at the site of the burn and the absorption of these into the general circulation. As in shock, there is a tendency for the blood pressure to be lowered and the pulse rate to rise, but it can be distinguished from shock clinically by the time of onset, a slight pyrexia, and often a tinge of jaundice. The treatment is to give intravenous glucose to stimulate and coax the liver, which bears the brunt of the toxic effect, and failure of which is responsible for the mortality from this condition.

Sepsis

After a few days sepsis in the burn may cause a deterioration in the patient's condition and will require treatment according to general principles; the local treatment of septic burns will be discussed later in this paper.

Complications

Chest complications such as bronchitis and bronchopneumonia may occur. From the fact that these conditions complicate virtually only burns of the face and front of the chest it is now thought that they are due generally to inhalation of hot vapour or flame at the time of the burn and need not be anticipated in burns elsewhere. Gastric, duodenal, or jejunal ulceration has been reported and, rarely, may lead to perforation.

Prognosis

With modern methods of treatment the prognosis from burns has been greatly improved. Second-degree burns involving 50% of the body surface may be expected to recover, and recovery is sometimes recorded after second-degree burns involving 75% of the body surface.

(The conclusion of this paper will appear next week.)

EXTENSIONS AT ROEHAMPTON

At Queen Mary's Hospital, Roehampton, the institution associated with the great work of artificial-limb fitting, a new operating theatre and A.R.P. block was opened by Lord Horder on May 20. The brief ceremony, presided over by the Minister of Pensions, Sir Walter Womersley, was followed by a demonstration by persons who have had amputations, illustrative of the results obtained by limb-fitting as carried out under the aegis of the Ministry. It was mentioned that of the 41,000 men who lost limbs in the last war, 26,000 had been fitted for their artificial limbs at Roehampton, and that since the outbreak of the present war 1,123 patients, amputated as the result of enemy action, had been dealt with, these comprising both Service and civilian cases.

The extensions include an underground operating theatre, with a roof of reinforced concrete, specially strong traverses, an air-conditioning plant, two emergency lighting schemes, and provision, in the event of a gas attack, for air to be drawn through charcoal filters both to the theatre and to the wards above; also a resuscitation ward, where casualties are first taken, and where every bed has its own set of pipes and masks for oxygen administration; and, finally, a new dining hall and kitchens, accommodating 500.