be found. Some of these symptoms may be *biologically* purposive, but they are of a type which cannot be imitated voluntarily, have acquired a certain autonomy of their own which cannot be abruptly terminated by changes in the environment, and, as some might say, are outside the patient's control.

To suppose that all affective reactions (i.e., states of anxiety and depression) are of an "escape" type and *personally* purposive would be both to overvalue psychogenesis and to confuse it with hysteria. It is of course true that the two types of reaction—*affective* and *hysterical*—may coexist: the readiness with which a given patient will succumb to or will utilize in a hysterical way the symptoms of an affective disorder will vary. Certainly many patients do so; or are not able or willing to put up with an affective reaction—especially the visceral components, which in themselves are not more severe than those experienced by other men who do not succumb. These are, no doubt, the causes of the incapacity produced by many so-called "organ neuroses," such as certain of the "functional dyspepsias" so common in the Services.

On the whole, therefore, it would seem more important to try to determine the presence and assess the intensity of genuine affective symptoms and to contrast this with the presence or absence of hysterical features rather than to contrast neurosis and psychosis. For the treatment of a predominantly affective reaction does differ fundamentally from that of hysteria, as does the type of personality that tends to be affected.

Broadly speaking, it may be said that the better type of individual, with a high sense of duty and morale, if he develops an illness as a result of war stress, will tend to develop an affective reaction. It is significant that many of these men did not report sick but were sent sick. The severity of the total psychobiological reaction to a given stress is presumably dependent mainly upon the constitutional predisposition, and severe depressive illness will only occur in the predisposed. On the other hand, men with a less strict sense of duty and lower morale tend to escape by the development of "pure" hysterical reactions or succumb to "affective" symptoms of relatively minor intensity. Consequently, assessment of the relative proportions of affective and hysterical features is of great importance in determining how much firmness should be shown, the possibility of a good response to semi-disciplinary measures, and whether a man should be kept at duty or not.

The group of cases that have been studied lie towards the depressive end of the scale of affective disorders. The type of personality in which these depressive reactions commonly arise and the constitutional, environmental, and physical factors which contributed to their development have been described. It has been noted that the majority of the patients, although showing symptoms of a constitutional or "endogenous" type, responded rapidly to environmental influences in hospital. This reactivity, although valuable from the point of view of therapy and a rapid recovery by civilian standards, increases the likelihood of relapse on return to active service. It does, however, serve to belie the attitude of therapeutic nihilism which is so often adopted towards patients who are wrongly thought to show a "purely endogenous illness."

Summary

Attention is drawn to the frequency of depressive states in war, which during the latter part of 1940 formed 13% of all admissions to a naval neuro-psychiatric unit.

The results obtained from the analysis of a series of 88 consecutive cases are recorded. No justification for a sharp and clearly cut division into "neurotic" and "psychotic" types could be found.

It is put forward that a more fundamental distinction would be between "affective disorders" (cases in which the mental and physical symptoms of either anxiety or depression, or both combined, are the main features) and hysterical reactions (in which the "escape" element predominates). Consequently it is more valuable to try to determine the presence and assess the intensity of genuine affective symptoms, and to contrast this with the presence or absence of hysterical features, than to contrast neurosis and psychosis. This is because the treatment of a predominantly affective reaction does differ fundamentally from that of hysteria, as does the type of personality that tends to be affected. As has been pointed out, the proportion of firmness to sympathy should vary in direct relation to the hysteria that is present in war cases; and, conversely, it is senseless to try to "keep in the firing line" genuine and severe affective states.

It was found in this series of cases that men of a fine type and excellent morale, but who for various reasons were deficient in adaptability, were, as the result of prolonged stress, prone to develop reactions which lay at the depressive end of the affective series. These depressions differed from those met with in civilian life by their rapid reactivity and better outcome. Thus, after a brief period of treatment, 25 patients (29%) were able to return to duty, and only 5 cases (6%) needed further hospital care. The prognosis and treatment of depressive states in wartime are discussed.

REFERENCES

- Cameron, K. (1940). *Lancet*, 2, 659.
 Curran, D. (1937). *J. ment. Sci.*, 83, 156.
 — and Mallinson, W. P. (1940). *Lancet*, 2, 738.
 Diethelm, O. (1936). *Treatment in Psychiatry*, Macmillan, New York.
 Lewis, A. J. (1934). *J. ment. Sci.*, 80, i, 277.
 Mapother, E. (1936). *Proc. roy. Soc. Med.*, 29, 858.
The Neuroses in War (1940). Ed. E. Miller, Macmillan, London.
 Ross, T. A. (1923). *The Common Neuroses*, Arnold, London.
 Sargant, W., and Slater, E. (1940). *Lancet*, 2, 1.
 Tooth, G., and Blackburn, J. M. (1939). *Ibid.*, 2, 17.
 Yellowlees, H. (1932). *Clinical Lectures on Psychological Medicine*, Churchill, London.

GENERAL PRINCIPLES OF TREATMENT OF AIR-RAID CASUALTIES *

BY

PHILIP H. MITCHINER, C.B.E., M.D., M.S., F.R.C.S

I must confess to a feeling of diffidence in dealing with the subject of the treatment of air-raid casualties, as owing to my administrative Army work I have had little opportunity of first-hand experience except during the period I was in Norway. I have, however, discussed the subject very fully with many colleagues from various hospitals who have considerable experience as surgeons under the E.M.S. in London and elsewhere, and am largely indebted to them for what I have to tell you.

Before proceeding to discuss the principles of treatment it is well to consider certain facts arising from experience in air raids on our cities, and the first and most outstanding fact is the small number of casualties compared with what was anticipated. Again, it is noteworthy that though the proportion of killed to wounded (I think seriously wounded only) is high—approximately one to two—the vast majority of those wounded suffer from very slight multiple wounds requiring no skilled surgical intervention, while of the seriously injured many are too ill to be helped by surgical skill. Thus the scope of surgery in air-raid casualties is very limited, though where it is justifiable it is often life-saving.

Head wounds are but seldom met with, though there is a most distressing, and all too frequently not fatal, injury—knocking away of part or even the whole of the face by bomb fragments owing to the victims not having

* A British Medical Association Lecture delivered before the West Somerset Division at Taunton, November 11, 1940.

thrown themselves *ventre à terre*. Therefore, when you hear bombs falling in your neighbourhood, forget your dignity and fall flat!

Principles of First Aid

First aid is performed on the spot by the first-aid squads, and very well they do it, too—with courage and without regard to the danger of falling shrapnel, bombs, and masonry. If I may be permitted one criticism of their work it is a tendency to take too long in carrying out unnecessarily elaborate first aid and bandaging, when it is far better for the victim to be treated quickly and conveyed as rapidly as possible to the warmth and cover of the hospital receiving-room or first-aid post. Arrest of haemorrhage, usually efficiently achieved by a pad and bandage, and the very rough splintage of fractures are all it is desirable to achieve "on the field." Tourniquets are seldom necessary, but if applied the doctor's attention should be drawn to them immediately the patient reaches hospital or a first-aid post.

I would bring the foregoing points especially to the notice of those who give first-aid instruction, and urge that these be impressed on their workers, as also the necessity of undressing victims as little as possible and keeping them warm by wrapping them up in blankets immediately the wound is dressed, thus minimizing exposure and wound shock (collapse). Another point I wish to stress is the necessity for training the squads to work in the dark or by the flickering light of a candle or the uncertain gleam of an electric torch; and, finally, the necessity for being able to do all this in a gas mask.

Reception of Wounded

It is my considered opinion that all cases should go to the reception-room of a hospital and there be seen and sorted by an experienced medical practitioner or surgeon. As stated, many of these cases receive multiple and apparently trivial wounds; and therein lies grave danger, for a cursory examination or an inexperienced eye may pass as superficial a small deeply punctured wound or be deceived by the apparent well-being of a patient with internal injuries, with serious and often fatal results. Lately I have seen two cases illustrative of this. In one of these a patient sent home from a first-aid post with multiple small and apparently superficial wounds died two days later from acute septic meningitis due to a fragment which had penetrated the brain through the left upper eyelid and orbital plate. In the second case a soldier, after bomb injury, walked a mile to the doctor and complained of a sinking feeling, which was attributed to a very natural fright. He was told to walk home, and later was found gasping, pale, and pulseless by the roadside. Subsequent operation revealed rupture of the liver and spleen, the result of blast. Too much stress cannot therefore be laid on the importance of careful but rapid sorting, or triage, as it is now fashionable to term it; and for this to be done efficiently experience and some system of coloured tabs is essential, so as to ensure precedence for cases of haemorrhage, open chest wounds, burns, etc.

Wound shock needs treating early and efficiently, and, though in mild cases warmth, rest, and hot sweet drinks may suffice, the addition of 1/4 to 1/3 grain of morphine is a valuable adjunct, while in all more severe cases blood transfusion, or serum or plasma transfusion in the case of burns or shock without wounds, is beneficial, and is expected by the lay public. Remember to rest such cases after treatment for at least half an hour before evacuation and do not usually give more than one pint of blood. Occasionally in severe cases a second given very slowly may be beneficial: the rate and volume of the pulse are the best guide to its necessity.

Team-work.—Here, as in all things, I wish to emphasize the value of team-work in ensuring the maximum of efficiency in the minimum of time—most essential in the rush of dealing with casualties in air raids, unless a "block" is to be created. Those concerned with stretcher-loading and unloading from ambulances, members of the refreshment department, the clerks, blood and burn and fracture teams, operating theatre staff, etc., must all be trained to work together, and if a particular worker is disgruntled or out of tune with his colleagues replace him (or her) at once.

Treatment of Special Injuries

The injuries met with include many varieties of wounds from bomb fragments and flying glass, crush accidents from falling masonry or burial under ruins, blast injuries, and burns from various sources.

Bomb Wounds.—These if bad lead to fatal results either directly or from their severity, such as in avulsion of an entire limb or evisceration; the majority of the remainder may be very slight and take the form of peppering with multiple small fragments, though of course injuries from medium-sized fragments are met with. It is obviously impossible to excise many small wounds, as the result would for practical purposes be a flayed patient. Such wounds must be more carefully examined to ascertain that no body cavity has been penetrated, and if any doubt exists, that particular wound must be excised and explored; otherwise the whole must be cleaned thoroughly and dressed with acriflavine or crude cod-liver oil ointment. No re-dressing should be carried out for at least ten to fourteen days, when healing will be found to have occurred in most cases. It is advisable to give sulphanilamide as a prophylactic against sepsis for the first four or five days.

Glass wounds may be very severe and deep, and are generally multiple. Sharp fragments will penetrate the skull and traverse the body cavities, doing as much harm to viscera as do bomb fragments.

Fractures are mostly of the open variety, and must be dealt with by free excision of the wound and fixation of the limb either by plaster-of-Paris or suitable traction apparatus. Much has been written about plaster-of-Paris as an immediate dressing. It is generally agreed that the results are good if the patient can be kept under observation for some days where the operation has been performed. Danger lies in infection and oedema under the plaster, causing gangrene of the limb: it is a very real danger, and if the patient is put in plaster this must be bivalved before evacuation. No one can say how long any patient will be in the ambulance, and there is no means to remove plaster on the journey. All fracture cases should be transferred as early as possible to special hospitals. As a general rule, for first aid all lower-limb fractures should be put up in a Thomas splint, and upper-extremity ones treated by Cramer's splinting and binding to the trunk for transport.

Thoracic Wounds.—Open pneumothorax must be closed at the earliest opportunity if death is to be averted. As a first-aid measure a large pad and a tight bandage must be applied at once and the patient be immediately removed to hospital, where very early operation is to be undertaken to cleanse the thoracic cavity and close the chest wall: such steps should precede any attempts at resuscitation. *Haemothorax*, not infrequently seen after blast and crush and through-and-through injuries, is best treated conservatively by rest and morphine, unless cyanosis or restlessness denotes respiratory distress, when aspiration must be performed promptly, and be repeated if necessary. Should subsequent infection ensue operative intervention will be carried out.

Abdominal wounds call for no special comment, save for the reminder that perineal or buttock wounds should be regarded with grave suspicion and the abdominal cavity be opened if any doubt is entertained that it may be perforated.

Treatment of Burns

Burns are common and are usually very severe, so that fatalities are frequent from this cause. Recently there has been great controversy as to the best method of treatment to employ; but, though I may be biased, I still think some form of tanning gives the best results and is most generally applicable. Shock is very severe in these cases, and needs prompt and thorough treatment both as a first-aid and as a resuscitant measure. Inasmuch as haemoconcentration can be demonstrated in these cases, transfusion of plasma or concentrated serum is preferable to whole blood, but the latter should be given if the others are not available. The fluid must be transfused slowly, as there is grave danger of fatal pulmonary oedema (for which reason intravenous saline is absolutely contraindicated), and may be repeated at intervals for the first few days—preferably by the drip method. The procedure is by no means easy in extensively burned patients, as superficial veins are not only hard to find but have a tendency to clot readily. As a first-aid measure tanning should be carried out promptly either by coating with tannafax or by applying a compress soaked in tea to the burnt area without any previous attempt to clean it other than removing charred clothing. It is a generally admitted fact that cases so treated remain fitter and suffer far less subsequent collapse. Hot sweet drinks and morphine should be given and the patient warmly wrapped and, if feasible, left lying quiet for half an hour before being evacuated in the ambulance.

At hospital, after treatment of the shock, scrupulous surgical cleansing of the burn, and, most important, the skin at its edges and six inches beyond, must be carried out promptly under anaesthesia, and all blebs opened and dead skin removed. Morphine alone is seldom sufficient in the rush, and can be supplemented safely by gas-and-oxygen anaesthesia; ether is too prone to cause pulmonary complications, and chloroform is too toxic to the damaged liver cells. Pentothal may be used in slight burns, but it is not always safe in severe ones owing to liver and kidney cell damage. Personally I now use a tannic acid compress, except for face, neck, and perineal burns, in which cases 1% aqueous gentian violet or powdered sulphanilamide is employed. Others, however, tan with silver nitrate and tannic acid, brilliant green, or albumin; while some apply cod-liver oil. Wakeley, Fleming, and Bunyan advocate warm saline-and-hypochlorite baths from the first, and the last-named has made ingenious silk casings to enclose the burnt areas so as to allow of frequent flushing over.

Lately there has been discussion on burns of the hands and fingers, it being claimed that tannic acid dressings cause necrosis and undue deformities. I can only say that in my experience I have not met these disasters. Necrosis subsequent to severe burns is not infrequent in the finger pulp, which often seems normal in appearance at first, and I suspect this may be responsible for the alarm and despondency of some of my colleagues. If this calamity is feared from the use of tannic acid then I suggest 1% aqueous gentian violet or even the saline baths advocated, though these are hard to manage except in a properly equipped hospital.

It will be seen that there is a good choice of methods of dressing burns. I cannot here discuss their merits or demerits; suffice it to say that as much care must be taken in preliminary cleansing as in wound excision; for this is

essential if a good result is to be obtained. In any case, owing to the great tendency to sepsis, it is advisable to give sulphanilamide from the first for four or five days, and if the patient is vomiting it can be injected.

Sulphonamides

I may be expected to say something about the use of sulphanilamide and the sulphonamide group of drugs. It is my considered opinion that these drugs in some form—and personally I think *prontosil* is as good as any, and certainly as cheap—should be given for the first four or five days in all cases of wounds and burns, as it seems that the chances of sepsis supervening are then greatly diminished and its virulence lessened should it occur. The drug can be given by mouth in doses of 2 grammes thrice daily—increased to four-hourly if sepsis appears—and for the first twenty-four hours in warm lemonade or citric acid solution so as to increase the rapidity of its absorption into the blood stream. If this be done there is seldom necessity for intravenous or intramuscular injection of expensive forms of the drugs, such a procedure being reserved for cases with severe vomiting.

Toxic effects must of course be watched for, especially leucopenia, and their appearance calls for prompt cessation of the drug's administration. Local application to wounds in the form of a pack is popular with some surgeons, from 5 to 15 grammes being employed—never more; but only in exceptional cases does this seem likely to have any advantage over prompt oral administration, as the drug has no local action on the wound. As a dressing for burns of the face and perineum powdered *prontosil* has its advocates and uses; but here again a word of warning is necessary regarding the quantities it is safe to employ for this purpose.

EXPERIMENTAL HUMAN SCURVY

NOTES ON A REMARKABLE STUDY REPORTED BY CRANDON, LUND, AND DILL

BY

F. W. FOX, D.Sc.

(From the Biochemical Department, South African Institute
for Medical Research, Johannesburg)

The following summary of an experiment carried out by a group of American investigators throws new light on the functions of vitamin C in human nutrition and on the problem of scurvy. It is of interest to compare and combine the results obtained with those reported by Fox, Dangerfield, Gottlich, and Jokl (1940).

Crandon, Lund, and Dill (1940) asked themselves the question, How long does it take a healthy adult to become scorbutic when fed on a diet otherwise fully adequate but entirely devoid of vitamin C? Crandon set to work to obtain an answer by experimenting on himself. The experiment was very carefully planned at the Medical School, Harvard, and was undertaken in close co-operation with several associated organizations and laboratories. This not only made it possible to carry out an extensive series of observations, but analyses were also duplicated by different observers and other valuable checks on the findings became practicable.

Crandon's Experiment

A normal active adult male placed himself on a vitamin-C-free diet, supplemented by all the other known dietary constituents, for a period of six months. The diet for the last four months consisted of bread, biscuits, cheese,