

'safe and useful' results," yet I thought my letter made it quite clear that I was asking for just that guidance. I doubt if any G.P. has enough experience and knowledge to supply it, but I did hope that possibly the author of "the erudite address," which I obviously appreciated, could do so.

Our problem may be illustrated by the example Dr. Todd offers. It is, of course, conceivable that all our cases of status asthmaticus which have benefited by morphine have really been attacks of cardiac asthma in our chronic asthmatics, but, if so, how are we to tell? Incidentally, the cough reflex he mentions is not of first importance in a man gasping for his life, but the factors I mentioned—"anxiety, distress, and the demand of the tissues for oxygen"—most certainly are. It is incontestable that vastly more lives have been saved in general practice by the use of morphine than by withholding it, and one main object of my letter was to find out how to avoid using it in dangerous cases.

We must remember that conditions in hospital are not the same as in general, especially country, practice, but it is certainly wrong to condemn potentially life-saving treatment just because it has potential dangers. The task of medicine remains, as I said in my first letter, not to damn but to define "when it is safe and useful and when it is not," and it requires much experience as well as great erudition to do so.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Parenteral Treatment of Crushed Abdomen

SIR,—The object of this case report is to show how modern intravenous treatment may keep both fluid and biochemical balance over a long period. Facilities for blood analysis are the only special ones necessary.

A 19-year-old man, weighing 8 st. 8 lb. (54 kg.), was crushed between two heavy vehicles. He was in a state of shock and showed signs that were those of either a ruptured gut or intra-abdominal haemorrhage. He had also a contusion of the right lung and heart. Laparotomy revealed a deeply lacerated liver that was repaired and a retroperitoneal haematoma of the right colon. On the 11th day a burst abdomen was found to be due to the effects of traumatic pancreatitis. On the 20th day a duodenal fistula appeared in the wound and persisted. Thereafter residual abscesses declared themselves by spontaneous discharge through the fistula and by discharge through a right loin incision made for that purpose. Until the 65th day his evening temperature averaged 102° F. (38.9° C.) and pulse 120. On the 65th day a painful abdominal episode associated with distension was accompanied by a sudden cessation of fever. This indicated that his major residual abscess had discharged into the gut. Then he was much improved, and recovery has since been complete.

Management was based on clinical observation assisted by accurate fluid charts and blood analyses for biochemical and haematological information. Intravenous management was particularly important in the first 19 days, when 65 pints (36.92 l.) of fluid were removed from his stomach by hourly suction. During this time intravenous fluids amounted to 115 pints (65.32 l.). This consisted of calculated quantities of Ringer's solution and combinations of glucose, saline, protein hydrolysate ("casydrol"), and blood. At this time he was balanced in fluid and salt. However, the protein had fallen to 6.3 g. % with an A/G reversal and the potassium to 15 mg. per 100 ml. The CO₂-combining power was 75 volumes %.

From the 20th to the 26th day the duodenal fistula discharged copiously. Having forgone solid food for three weeks, it was considered necessary tentatively to introduce protein and salts by mouth. This, with intermittent stomach suction and continuous fistula suction, was augmented by repeated intravenous drips that included Darrow's and Ringer's solutions. By the 30th day the fistula was practically dry. There had developed, however, an alkalosis, indicated by 79 volumes % CO₂ combining power and a blood salt reduced to 480 mg. per 100 ml. The potassium meanwhile had improved to 17 mg. %. Subsequently the diet was supplemented by potassium chloride cachets of 1 g. daily and deliberate salt consumption by the patient. It was noted how chloride continued in the urine in spite of a depleted blood salt while the alkalosis remained. Thus blood samples were essential for chloride estimation. Protein hydrolysate intravenously and by mouth assisted the recovery

of the plasma protein. By the 35th day the patient's blood chemistry was normal apart from a slightly reduced plasma protein, and he was taking increasing quantities of light diet. Until the 65th day his weight remained the same at 6 st. 12 lb. (43.2 kg.) in spite of the continued fever. During this period transfusions were also administered at about fortnightly intervals to restore his haemoglobin from 60% to 75% on each occasion. The co-operation of the patient in taking all necessary dietary supplements was achieved by keeping him informed of his requirements. Thus his nutrition remained virtually balanced for nine weeks with intravenous administrations and a small diet.

Grateful acknowledgments are due to Mr. J. H. Conyers for his encouragement in treating this young man. For the careful attention that resulted in his recovery they are due in particular to Captain Smith and Sister Lester of the Military Hospital, York.—I am, etc.,

Manchester, 6.

STEVENS DIMANT.

Bathing and Vestibular Palsy due to Streptomycin

SIR,—May I raise the question of the behaviour under water of the children who were treated in the earlier post-war years with streptomycin for tuberculous meningitis, and who may be making their first ventures into a medium entirely new, constituting a special predicament for them, denuded as they invariably are of vestibular sensation? My own belief, based on otoneurological observations at the time, is that few, if any, will have recovered from this selective paralysis, and a pronouncement by more recent workers is desirable as to whether complete immersion during swimming and diving may prove a hazard. Ordinarily, the direction of light penetration and water-pressure at body surface will be aids to orientation, but young children with bilateral vestibular palsy may be expected to panic or even drown if unattended.

I would remind physicians who have had the immense satisfaction of delivering these children from a previously fatal disease at so relatively small a cost in terms of sequelae that successful performance of the ordinary clinical neurological tests of balance can cover gross vestibular defect; they may wish to advise school health services of cases where recovery of specific vestibular function has not been established.—I am, etc.,

Bramhall, Cheshire.

H. C. PURCER SMITH.

Use of Succinylcholine in E.C.T.

SIR,—We have read the article on the use of succinylcholine in E.C.T. by Drs. D. J. Adderley and Max Hamilton (January 24, p. 195) with much interest. We should, however, like to suggest that the rise in blood pressure following the injection of succinylcholine is not due to the drug but to the fact that the patient was ventilated with a mixture of 5% carbon dioxide in oxygen. This mixture, with or without efficient ventilation in an apnoeic subject, could easily produce a carbon dioxide build-up, the effect of which has been long known to cause an increase in blood pressure at least as high as that recorded in the article.—We are, etc.,

London, W.12.

J. A. SMITH.

F. G. WOOD-SMITH.

Relationship of the Suprarenal Cortex to the Differentiation of Chromaffin Cells

SIR,—As a result of our studies in several species of animals, we reported in 1951¹ that the amounts of noradrenaline and adrenaline found in the suprarenal glands seemed to bear some relationship to the relative size of the cortex. In the rabbit and guinea-pig (where the cortex is large relative to the medulla), methylation of noradrenaline to form adrenaline is almost complete, whilst in the whale and fowl (where the medulla is relatively large) only a small amount of adrenaline is found. It was suggested that the cortex might be intimately concerned with methylation of noradrenaline.

Further work indicates that methylation can occur even in the absence of intimate relation with the cortex. Both adren-