quarter by severe intellectual impairment; less than 10% could be discharged from hospital. A controlled trial carried out at the Boston Psychopathic Hospital[1] showed both unilateral and bilateral standard leucotomy to have a worse outcome than bimedial leucotomy.

Controversy at present concerns the various modified leucotomies. Are they of benefit? Which is preferable? And how can operation best be suited to the category of illness? The best documented are bimedial leucotomy and orbital undercutting. F. Post and colleagues[7] reported a follow-up of 54 patients who had bimedial leucotomy, in which the cut is made in the same plane as the standard operation but is restricted to the medial 2 cm of white matter in each hemisphere.[8] They considered that 40% had benefited from it and only 8% were made worse, and they concluded that modified leucotomy should not be witheld too long from "patients of middle and late adult life with persistent and seriously disabling non-schizophrenic functional psychiatric disorders." In retrospectively controlled trials the same operation has been found of benefit in agoraphobia and obsessional neurosis.[9 10]

For many years G. C. Knight[11 12] has been developing the technique of orbital undercutting originally introduced by W. B. Scoville.[13] In this operation the brain is approached from the frontal poles, and the lesions are made in a horizontal plane in the white matter overlying the orbital cortex. Knight found that the crucial cut was the last 2 cm of the 6 cm incision, an area lying in the substantia innominata between the head of the caudate nucleus above and area 13 of the cortex below. Further improvements in technique have been a stereotactic approach and the use of seeds of radioactive yttrium to produce a more circumscribed lesion. Uncontrolled follow-up studies of patients submitted to this procedure have shown favourable results,[14 15] and undesirable side effects have been gratifyingly slight. As with bimedial leucotomy, the best results were obtained in patients with depressive and anxiety states and obsessional neuroses, whereas the schizophrenic patients did not do well.

Where do these studies leave us? The only impartial answer to this question must be, "In a state of uncertainty." Now the Royal College of Psychiatrists has been formed, let us hope that it will encourage the thorough investigation of these promising but unproved forms of psychiatric treatment. Perhaps the new royal college could join with the Royal College of Surgeons in arranging a prospective trial. Certainly there could be no ethical objection to such a trial in patients with intractable and severe depression or tension while the value of neurosurgical procedures in these conditions remains undecided.


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# Electrical Activity of the Stomach

The motor activity of the stomach subserves two functions, mixing and emptying. They are affected by a variety of exogenous stimuli, including the nature and consistency of the gastric contents.[1] There is in addition rhythmical electrical activity in the stomach, which appears to be important in the regulation of gastric motility. In recent years physiological studies in animals and man have defined its significance in greater detail.

Fifty years ago W. C. Alvrez first observed that strips of longitudinal muscle taken from different parts of the stomach had different spontaneous rates of contraction.[2] Higher rates of contraction were found in muscle strips taken from near the cardia. He suggested that at the proximal end of the stomach there was a gastric pacemaker. A few years later, in 1921,[3] he recorded slow rhythmical electrical activity, which has since become known as the "basic electrical rhythm." It originates in longitudinal muscle and has been found to occur in many species at a rate of 3 to 6 cycles per minute. This electrical activity is not necessarily accompanied by muscular contractions. When contractions do occur they are synchronized with this slow-wave activity, which suggests that it is a controlling mechanism for the rate of gastric contractions.

The basic electrical rhythm spreads distally towards the antrum. Transections in the mid-stomach reduce the rate in the distal stomach, which provides further evidence that the proximal area acts as the pacemaker. Recent studies in the dog suggests that the gastric pacemaker is sited on the proximal greater curvature.[4]

At the distal end of the stomach there is also rhythmic electrical activity known as the "pacesetter potential" of the gastroduodenal junction. It was thought to spread from the gastric antrum only as far as the junction of the stomach and duodenum. As a result of work in animals the pylorus has been described as an "electrical insulator."[5 6] A recent study from Sheffield by H. L. Duthie and his colleagues[7] indicates that, in man, 3-cycle-per-minute potential extends from the antrum into the proximal 10 cm of the duodenum. These data were obtained by implanting silver electrodes in the stomach and duodenum of ten patients undergoing cholescystectomy. The implants were removed through the drainage site six days after operation.

Thus the antrum, pylorus, and duodenum of man appear to act as an electrically co-ordinated unit. It is of interest that the rate of conduction across the pylorus was about four times as fast (2 cm/sec) as in the antrum (0·5 cm/sec). The exact route of conduction from antrum to duodenum has not been defined but it might be via the few longitudinal muscle fibres that continue from the antrum across the pylorus.

Ingestion of water, citrate, and oleate slowed the frequency of the antral pacesetter potential for ten minutes After the citrate and oleate meals the levels of activity increased above the resting level after 10 minutes. Injections of morphine had no effect on the pacesetter potential of the antrum, but had some effect in increasing action potentials in the duodenum. This may be relevant to the mechanism of nausea caused by morphine.

Certain gastric operations such as segmental resection[8] and proximal gastrectomy divide the proximal and distal[9] ends of the stomach. At times they are associated with de-

layed gastric emptying, which has usually been explained by disturbance of motility caused by vagotomy. Perhaps a more rational explanation is that the gastric pacemaker and its conduction system has been separated from the distal stomach.[10] Surgical manœuvres at the distal end of the stomach could also affect the conducting pathways between the antral pacesetter and the duodenum.

The intrinsic electrical activity of the stomach may be as important to gastric motor function as is that of the cardiac pacemaker and conducting system to the functioning of the heart.


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# Voluntary Services in Hospitals

At the start of the Health Service there were fears that voluntary services might be discouraged in our hospitals,[1] but fortunately better counsels prevailed.[2] In the past ten years the rapid growth of these services, often with paid organizers,[3] has helped to canalize the fund of goodwill evident in most communities towards their local hospitals.[4] So at a time when further community participation in the health services is being proposed a review of voluntary schemes is particularly welcome. This has recently been done by the Hospital Centre in Scotland[3]—a country where progress with voluntary services has been somewhat slower than elsewhere in Britain. Divided into four parts—a review of official and other reports, the results of a survey in Scottish hospitals, a general appraisal, and a report on progress in England—the report will be particularly valuable for those proposing to set up or expand similar services of their own. Nevertheless, it should also be read by doctors, nurses, and administrators alike for the light it sheds on the value of a service many are now apt to ignore or to take for granted.

Volunteers, the report suggests, are essentially a direct link with the community, contributing to the wellbeing of patients by supplementing the statutory services. All social classes and age groups should be represented, and the precise work they do should be determined by a careful survey of local conditions and needs, and with the agreement of the hospital staff. Generally voluntary work takes the form of personal services to the patients—including reception, visiting and talking to long-stay patients, and transport of patients' friends and relatives—but a wide variety of tasks may be undertaken. Only a few volunteers should be introduced into a hospital at a time, and the report emphasizes the importance of telling them about hospital etiquette and regulations, the staff, and the types of patients they are likely to meet.

Sometimes circumstances may not justify the appointment of a paid organizer—for example, where a scheme organized by a hospital league of friends has been found to work well. Nevertheless, even where a lot of voluntary effort is already provided, a skilled co-ordinator can often make this more effective and evenly distributed, an aspect recognized in the Government's Green Paper.[5] Certainly the evidence in this report confirms the statement that "there is undoubtedly a much greater potential for the participation of voluntary workers in the health service than has been realized in the past. There are many needs of the sick and handicapped which are better met by voluntary workers than by paid staff."[5]


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# Anaesthetics and Platelets

The list of compounds known to affect platelets grows steadily longer. It includes most vasodilators, many anti-inflammatory compounds, tranquillizers, and dextran, together with a wide variety of drugs that are unrelated to these groups and to each other.[1] Commonly used anaesthetics have now been shown to influence platelets,[2] and the question is posed whether anaesthetics might induce a bleeding tendency sufficient to be a risk during surgical operations.

Platelets have an essential role in haemostasis. The first defence against a loss of continuity in the wall of a blood vessel is the formation of a plug of platelets stuck to each other and to the vessel wall. This plug is stabilized by fibrin strands. A tendency to bleed can result either from failure of the platelets to stick to each other or to the vessel wall, or from a failure of fibrin formation. Severe bleeding usually occurs only when both processes are defective. Fibrin formation is easy to study in vitro, and the mode of action of the various coagulation factors is relatively well understood.[3] But our knowledge of the mechanisms by which platelets stick together lags well behind, and it is by no means certain that any of the techniques used to study platelet behaviour in vitro are relevant to the situation in vivo.

I. Ueda[2] has shown that methoxyflurane, halothane, diethyl ether, and cyclopropane, at concentrations similar to those that would be used clinically, inhibit the aggregation of dog platelets that is induced by adenosine diphosphate. In his experiments the sticking of platelets to each other was measured by an optical-density technique as platelet-rich plasma was stirred in a test-tube. The mechanism by which the anaesthetics inhibit platelet aggregation is unknown, but as anaesthetics "stabilize" membranes in various ways it seems likely that they also alter the surface characteristics of blood platelets.

An alteration induced by anaesthetics in the aggregation of dog platelets in vitro does not of necessity imply that human platelets will fail in their normal function in vivo during anaesthesia. Clearly direct measurements of the effects of anaesthetics on the bleeding time in man are required. But anaesthetists may draw comfort from the fact