cutting had previously suggested that the area of the substantia innominata might be crucial for the success of the operation. In order to obtain a localized lesion in this region he has gone on to implant radioactive yttrium-90 seeds with a stereotactic device under radiological control. The short range of emanation of these seeds made the technique seem appropriate ; electrical and ultrasonic methods may refine it further when the optimal site of the lesion has been established.

How far the operation achieves its therapeutic aim is more difficult to assess. By the yardsticks of mortality and post-operative complications the 90 patients in Knight's series are reported to have done very well, though the impact of the surgical operation on personality and working capacity have still to be assessed in detail. On the central issue of the clinical benefits derived from this complex procedure Knight is refreshingly definite: " The majority of patients suffering from depressive illness can be improved by surgical means when psychiatric treatment fails."

Confirmation of so large a claim would be welcome in view of the distressing and often intractable nature of chronic affective disorders, but the effects of modified leucotomy on the course of these conditions are still controversial. The suggestive but inconclusive nature of the evidence from other studies has been discussed by J. L. T. Birley, who has concluded that " further evaluation of the operation can best be done—perhaps can only be done—by controlled clinical trials."[3] A study of this type would demand the collaboration of physicians and surgeons at several centres if results were to be obtained within a reasonable time. The recently published Medical Research Council's clinical trial of treatments of acute depressive illnesses has shown both the feasibility and the value of such studies in this field.[4] If surgical skill is not to outstrip clinical judgment the case for a controlled, and preferably prospective, investigation is a strong one.

Foetus and Newborn

The time may be coming when the medicine of the unborn foetus will occupy doctors almost as much as the medicine of post-natal life. In a very short time we have passed from regarding congenital malformations or early neonatal death as acts of God to the recognition that they are caused by adverse factors which can be studied and circumvented. Examples are the congenital abnormalities caused by maternal rubella or ingestion of thalidomide, and the death of some babies soon after birth primarily owing to the immaturity of enzyme systems in the lung or liver. Already in intrauterine transfusion of the foetus endangered by rhesus incompatibility we have an example of diagnosis and treatment applied to the unborn. But advances in this new branch of medicine and in the related fields of obstetrics and neonatal paediatrics require new foundations to be laid in studies of the physiology, pharmacology, morbid anatomy, biochemistry, and immunology of the foetus. Following the lead of Barcroft, and his successors such as Huggett and McCance, research workers in Great Britain have made notable advances in the study of the foetus and newborn. In a new issue of the *British Medical Bulletin*[1] recent work in this field is summarized in a series of papers by research workers.

Four of the papers in this issue deal with the problems of placental function and foetal nutrition. In one paper studies of placental morphometry are shown to provide information of importance to the study of placental transfer. Other papers deal with the requirements of an artificial placenta, with retardation of foetal growth by restriction of placental blood supply, and with the related problems of glycogen stores and hypoglycaemic episodes in newborn infants. A further group of papers is on the development of the central nervous system. They draw attention to the great gaps in our knowledge of this subject, which is particularly important for understanding the causes of mental defect and cerebral palsy. But failure of the respiratory functions of the placenta and lung is probably the commonest cause of cerebral damage near the time of birth, and it is certainly the commonest cause of death. Recent advances in understanding the cardiovascular and pulmonary adjustments which take place at birth are described in articles on the activation of the respiratory centre at birth, the properties of the liquid–air interface created by the first breath, and the responses of the pulmonary and systemic circulations.

As the newborn infant emerges soaking wet into a cold world, he requires the means to increase the production of heat to maintain the temperature of his body. Papers in the present issue deal with the mechanisms of heat regulation in newborn animals and the role of brown fat in the metabolic response to cold. From the earliest times keeping the baby warm has been an important part of baby care, but modern studies have shown that rather precise control of environmental temperature is important in lowering the metabolic needs of premature infants, for their surface is large in relation to their volume and so loss of heat is unduly high, while their equipment for respiratory exchange and assimilation of food can be imperfect.

Many of the problems of the newborn infant arise because the metabolic functions of the placenta are no longer available after birth, and enzyme systems have to develop in order to meet the new needs. The induction of enzyme activity and the development of metabolic pathways is certainly fundamental to many of the problems in the developing foetus. To this important subject the late Dr. Michael Dawkins has contributed a masterly paper which deals with the development of metabolic pathways in the liver. As a foreword rightly states, " Many of his friends will regard this *Bulletin* as a tribute to his memory."

Hospital Costing

The new sections of the hospital costing returns, which have just appeared, add some details to the main ones, which were published in December.[1] They give exact unit costs of departments like catering, laundry, power, medical records, physiotherapy, and of administration, and are intended to encourage finance officers to investigate any apparent excessive expenditure in their own hospitals. The results of the departmental costing are, however, summarized in the main returns, and these do provoke some questions. The average cost of maintaining an in-patient in an acute hospital for a week went up by nearly 8% between 1963–4 and 1964–5: from £33 9s. 6d. to £35 17s. 8d. This is about what one would have expected, having regard to the rise in prices and incomes in that period ; most of the cost of main-

[1] *Brit. med. Bull.*, 1966, 22, 1-102.

[1] *Hospital Costing Returns*, Parts 1-3, Ministry of Health, 1965. H.M.S.O.

taining an in-patient is, of course, attributable to expenditure in the wards, both direct—like salaries and drugs—and indirect—like power, laundry, or administration; and of the direct expenditure in 1964–5 salaries came to £16 12s. 7d. a week, compared with £15 11s. 9d. in the previous year. But offsetting the higher cost of maintaining a patient is the fact that he is not kept in hospital so long as he used to be. If the total in-patient expenditure is divided by the number of discharges and deaths, we find the cost of treating a case. This went up by about 4% in 1964–5, compared with less than 3% in the previous year, from £58 11s. to £60 15s. 2d., and the average stay per case went down from 12.2 days to 11.9.

But the hospitals might well ask themselves whether the average stay could not be reduced further. The Oxford region's hospitals, it is worth noting, continue to have the highest costs per week of all the regional boards (£40 9s. 7d.). But they actually showed a small reduction in the cost of treating a case, which was only £49 9s. 11d., because they reduced the average length of a patient's stay from 9.1 days to 8.6. Has this very short stay drawbacks? If not, should not other acute hospitals consider following Oxford's example and increase their turnover of patients accordingly?

In contrast to Oxford, the acute London teaching hospitals keep their patients on the average for 14.3 days, and their average cost of treating a patient is £103 5s. It is also worth pointing out that among the provincial teaching hospitals Oxford scores again. The Radcliffe Infirmary keeps a patient for only 8.1 days, and the cost of treating him (£54 12s. 10d.) is little more than half what it would be in a London teaching hospital.

The latest returns show, for the first time, Lambeth and Dulwich hospitals among the London teaching hospitals, these having been taken over by St. Thomas's and King's respectively. This transfer has had the effect of making the teaching hospitals' average cost lower than it would otherwise have been. It remains to be seen whether in the next returns they, and other London district hospitals due for takeover, keep their separate entities, and, if so, what is the effect of the mergers on their costs.

Diet in Old Age

A recent publication by the King Edward's Hospital Fund breaks new ground in the difficult study of nutrition in ageing. In it Dr. Exton-Smith and Miss Stanton report on the diets, clinical conditions, and social circumstances of sixty women over the age of 70 years living alone in the two London Boroughs of Hornsey and Islington. Besides answering some questions the report poses others of great interest. Some of these could most effectively be investigated by general practitioners, who are well placed, for example, to investigate the nutrient intake of confused people living alone, or to study over a period of time the relationship between decreased calorie intake and loss of weight in the eighth decade, or to try out methods of educating old people in good dietary habits.

The authors found the old women managed to consume a varied diet and did not all live on the traditional bread-and-jam. However, some diets were ill-balanced and provided too little vitamin C, vitamin D, calcium, iron, or protein. When the general levels of health and nutrition were assessed it was found that there was a striking deterioration in the late seventies. Up till the mid-seventies the norm was a lively active woman confident in her own health, a confidence justified by the results of the clinical and biochemical tests which were applied. In the late seventies the norm was a condition of slow deterioration with loss of weight, demineralization, and impaired vigour. The conclusion, therefore, is that special care to preserve health should begin in the early seventies.

The diet of the women in their late seventies provided on the average about 20% fewer calories than that of women in the early seventies. Reduction in calorie intake was correlated with loss of weight, but the evidence does not yet suffice to distinguish causes and effects. The intake of protein fell proportionately more than did the intake of total calories, and this is thought to result in a significant protein deficiency. As appetite decreases with age, therefore, the diet should contain a higher percentage of protein, fats, minerals, and vitamins, and a lower percentage of carbohydrate. Unfortunately many of these old people developed a liking for sweet things, so a reverse tendency was in fact noted. Demineralization of the skeleton[2 3] was observed in 20%, and this group of women took less calcium and vitamin D than the average. These findings suggest that osteomalacia may contribute to the skeletal rarefaction so commonly found in old age, and until more evidence is obtained on the cause of demineralization it would seem reasonable to encourage the elderly to take more milk and cheese. Obese people were found to consume a smaller number of calories than lean people, so perhaps doctors should be more impressed by the protestations of the well-covered that they hardly eat anything. The authors suggest that the insulating effect of fat conserves calories, but this fails to explain how the subject first became fat—another problem thrown up by the study that needs further investigation.

"Meals on wheels" and club meals can do much to correct dietary imbalance in the elderly, but the meal should be designed with the findings of this survey in mind. It should contain a high proportion of protein with an adequate supply of calcium, iron, and vitamin D presented in such a way that the whole meal is eaten. The extra cost this entails must be accepted. From their food analyses the authors show that to have an adequate effect on nutrition these meals should be eaten three to four times a week. Care should be taken in cooking and delivery to prevent loss of nutritional value. As the food must sometimes be kept hot for long periods in the "meals on wheels" service, it might be beneficial to provide vitamin C separately in some form when the meal is delivered.

In general the investigators did not find that poverty was the main cause of malnutrition, though the subjects from one of the boroughs were selected because they were expected to be malnourished. They did find that prejudice about food and ignorance about its preparation were widespread. Some women could not be included in the survey because their mental processes were inadequate to the task of co-operation, and their nutrition, they conclude, was probably worse than that of the women they surveyed. Pleading for more education on the subject, Dr. Exton-Smith and Miss Stanton add a warning that old people such as they interviewed do not easily accept new ideas.

[1] Exton-Smith, A. N., and Stanton, B. R., *Report of an Investigation into the Dietary of Elderly Women Living Alone*. King Edward's Hospital Fund for London. 1965.
[2] *Brit. med. J.*, 1964, **1**, 650.
[3] Ibid., 1965, **2**, 664.