fundamentally right. As one of the speakers at Chichester observed, "Reorganization has given us the framework; now we've got to get changes in decision-making—the Department and the politicians have got to devolve decisions down to district level." The sort of decisions that are being and should be taken at the district level will be examined next week, when the first year's experience will be reviewed.

[1] Department of Health and Social Security, *Management Arrangements for the Reorganized Health Service*. London, H.M.S.O., 1972.
[2] *Report of the Committee on the Local Authority and Allied Personal Social Services*, Cmnd. 3703. London, H.M.S.O., 1968.
[3] *Local Authority Social Services Act*, 1970.

Nature and Nurture in Childhood Obesity

Up to one third of babies in Britain are too fat during their first year of life, and though the prevalence of obesity during the school years drops to around 6% it rises sharply again in adolescence, especially in girls, and may once more approach 20-30%. The treatment of established obesity in children (at least in those attending hospital obesity clinics) is so poor, with 80% relapsing and remaining obese in adult life, that increasing attention is being paid to prevention during infancy and childhood. Any planning of effective preventive measures requires knowledge of the relative importance of the various aetiological factors, and this information is at last becoming available.

There is known to be a genetic component in the causation of obesity, but it has been difficult to separate this true genetic effect from the contribution made by environmental factors —which also tend to run in families. Brook and his colleagues have examined (p. 719) the relative contributions of genetic and environmental factors by measuring skinfold thicknesses in 222 pairs of like-sex twins of whom 78 were monozygotic and 144 dizygotic. They concluded that genetic factors appeared to be more important in determining trunk fat (estimated by subscapular skinfolds) than limb fat (estimated by triceps skinfolds). Genetic factors played a greater part in determining limb fat in girls than in boys. Above 10 years of age it was found that heritability was high for both trunk and limb fat in boys and girls, but for younger children environmental influences appeared to be of greater importance, and only in the trunk fat of younger boys was the degree of heritability high. The study contained only few twins who were actually obese and no special investigation of these was possible; the results of the study therefore strictly only apply to heritability of skinfold thickness over the normal population range, and the findings could be different in obese individuals. Nevertheless it is clear that genetic factors are more important in determining the amount of adipose tissue in childhood but that they do not operate to the same degree at all ages, that their influence differs between the sexes, and that the site of fat deposition is also under some degree of genetic control. Further studies are now required to determine whether, and to what degree, genetic factors continue to operate in adult life and also the mechanism(s) by which they cause excess fat deposition.

The implications of these findings—if indeed they are applicable to obese children—are that obesity may be reasonably easily prevented in younger children by controlling environmental factors, but that in older children prevention or treatment by environmental adjustments is likely to be more difficult because of the strong genetic component operating at this time, to which may be added the difficulties of parental control over adolescent eating habits.

The two major environmental causes of obesity are an excess of energy intake and a reduction in energy expenditure; the two often operate together. At all ages there is a wide range of nutritional individuality so that energy requirements to balance expenditure can vary as much as twofold between children of the same age, sex, and weight. In the first few months of life excess energy intake is likely to be the main factor producing obesity. Only a small proportion of babies are breast fed, and artificially fed infants have accelerated growth in both height and weight;[1] [2] many of these babies will also be fat. Most artificial feeding regimens neglect the concept of nutritional individuality, and when coupled with the tendency to give over-concentrated feeds,[3] and the early introduction of solids[4] this tends to promote an excess energy intake. In older children the relative contribution of energy intake and output to the causation of obesity is less easy to determine. Scant information is available on prepubertal children. In one study of boys and girls aged 2-11 years the heavier and taller children had greater energy intakes,[5] but it cannot be assumed they were fatter, and there was no information on energy expenditure. In studies on groups of 14-year-old children Durnin *et al.*[6] found that over a seven-year period there had been an increase in body fat in the boys but a decrease in mean energy intake; they speculated that there had been a diminution in physical activity, but were not able to prove this by the methods currently available. More attention should undoubtedly be paid to the role of physical activity in both the genesis and management of childhood obesity.

If current knowledge can be translated into action, programmes to prevent childhood obesity should probably vary at different ages. For babies the major emphasis should be on better infant feeding[4] by education of parents and parents-to-be. Advice on diet and exercise should be given at an early stage to the parents of the small proportion of younger schoolchildren who show signs of getting too fat. During puberty and in adolescence special attention should be paid to family history and effort concentrated on giving advice to those children and young people in whom genetic factors appear most likely to operate. Such advice should include encouragement to increase energy expenditure as well as to control food intake.

[1] Taitz, L., *British Medical Journal*, 1971, **1**, 315.
[2] Ritchie, C. D., and Naismith, D. J., *Proceedings of Nutrition Society*, 1975, **34**, 118A.
[3] Wilkinson, P. W., *et al.*, *British Medical Journal*, 1973, **2**, 15.
[4] Present Day Practice In Infant Feeding. Report on Health and Social Subjects, 9. London, H.M.S.O., 1974.
[5] Cahn, A., *Journal of American Dietetic Association*, 1968, **53**, 476.
[6] Durnin, J. V. G. A., *et al.*, *British Journal of Nutrition*, 1974, **32**, 169.

Research in Dentistry

Dentistry may well be defined as "what dentists do"—yet what they do is often ill understood even by their colleagues in general medicine. Dentists are known to be concerned with diseases of the teeth and their supporting structures and with the prevention and treatment of caries and periodontal disease in particular; they are also keenly interested in the rest of the oral cavity, its structure, function, and diseases. Since

the oral cavity as a functional unit includes the salivary glands and temporo-mandibular joints they are concerned with these also. The fascination of dentistry lies not only in the challenge of its two major diseases and all the elaborate technical skills which may be deployed to repair the damage they cause, but also the wide range of other conditions which affect the oral cavity and its associated parts.

As Professor B. Cohen comments in his introductory remarks to the latest *British Medical Bulletin*,[1] on the topic of research in dentistry, the incidence of dental caries has reached pandemic proportions in modern urban populations. Periodontal disease likewise is an almost universal scourge of dentate modern man. Few other conditions can rival them both for their high incidence and for the complacency with which the general public regard such widespread morbidity. Even more remarkable is the general reluctance of communities to make use of the public health and preventive measures which have been advocated for their control. Fluoridation of the water supply and the elimination of between-meal snacks, two simple measures, would greatly reduce the incidence of dental caries, as Hartles and Leach[2] point out.

Both dental caries and periodontal disease are inherently difficult processes to investigate, and a few of the methods used are reviewed in the *Bulletin*. These papers give some insight into the many facets concerned: the structure of the tooth, the physiology of the gingiva, the composition of plaque, the epidemiology of caries, investigations into the way treatment may be organized and effected, and the effects on the tissues of some of the instruments used in treatment. Perhaps it is worth commenting that this last spring at the meetings in New York and London alone of the International Association for Dental Research over 1000 papers were read.

The 1921 Dentists' Act was drawn up to prevent unskilled dental practice, and the simplest way to do this was to forbid anyone except qualified dental and medical practitioners from undertaking procedures in the oral cavity. At the same time, however, the Act effectively prevented the development of properly trained ancillary help, such as has grown up over the years in general medicine. Fortunately, in the same year New Zealand started to train operating auxiliaries or "New Zealand dental nurses," showing the way that the graduate dentist could be freed from some of the less skilled duties in the practice of his profession. Allred and Hobdell's review[3] of the development and enlargement of the dental team gives a glimpse of the dental practice of the future.

Though it is a specialized branch of medicine there has always been a separate undergraduate course for dentistry in Britain. In no small part this is due to the many technical skills which the general dental practitioner must possess; but the separate undergraduate course is also justified by the time taken to achieve an initial understanding of the diseases and the diverse pathological processes of the region. Based on this knowledge have grown the specialities of dentistry. Some of these, like oral and maxillofacial surgery, oral pathology, and oral medicine have moved closer to the main stream of medical practice. Not a few of their practitioners have both a dental and a medical qualification. Some have higher qualifications not only in dentistry but also in the appropriate related special field of medicine. With the growth of these specialties there has been an upsurge of interest in the treatment of facial deformity, neoplasia of the jaws and oral cavity, and diseases of the oral mucosa and salivary glands.

With the increasing complexity of modern therapeutics the importance for the general dental practitioner of a good understanding of general medicine is also increased. In order to facilitate this broader training in general medicine and to foster the continued growth of the specialties of dentistry, perhaps the time is ripe for a closer correspondence and a greater degree of interchangeability between the undergraduate courses in the two subjects.

The work surveyed in this *British Medical Bulletin* foreshadows the emergence of a dentist with rather different main interests. Were the general public to show a more responsible attitude towards their dental health and accept help from public health measures the incidence of caries and gross periodontal disease could be reduced. There would be, as a result of the same change in attitude, a more widespread desire for the restoration of those cavities which did occur, for professional control of periodontal disease, and for the correction of irregularity of the teeth and malocclusion. As the incidence of these conditions fell there would be every likelihood that the dental surgeon, supported by his operating assistants, could cope effectively with this demand for treatment. What is more, a liberally educated general dental practitioner would have time to join more closely with the specialist dental surgeon to deal with the many other problems of the maxillofacial region, some of which are no better understood today than caries and periodontal disease were a generation ago.

[1] Cohen, B., *British Medical Bulletin*, 1975, **31**, 99.
[2] Hartles, R. L., and Leach, S. A., *British Medical Bulletin*, 1975, **31**, 137.
[3] Allred, H., and Hobdell, M. H., *British Medical Bulletin*, 1975, **31**, 149

Cardiac Implantation

Total cardiac transplantation carries the obvious disadvantage that the recipient's future survival depends on the continued function of the transplant. Barnard and his team in Cape Town have now devised a new technique in which a donor heart is anastomosed in parallel to the patient's heart in such a way that the function of the patient's own heart is left intact.[1] The two patients[1] who have been treated by this technique were a man of 59 with ischaemic heart disease and advanced left ventricular failure and another man aged 47 who had rheumatic heart disease with aortic regurgitation and severe left ventricular myocardial dysfunction.

The donor heart is placed partly in the right pleural space and partly in the anterior mediastinum, next to the patient's own heart. Similar sized windows are made in the walls of both the donor and the recipient left atrium, and a side-to-side anastomosis is made between the two openings. An end-to-side anastomosis is made between two aortas; and another end-to-side anastomosis is performed between the donor's pulmonary artery and the patient's right atrial appendage. The superior and inferior venae cavae of the donor heart having been tied off, its right ventricle has only its own coronary sinus return to handle, and this is returned into the patient's right atrium. The patient's right atrium and right ventricle receive both his own venous return and the coronary sinus return from the donor heart, and they function in a normal manner. Blood from the patient's pulmonary veins enters his own left atrium; it may then flow either into his own left ventricle or through the window into the donor left atrium to be pumped by the donor left ventricle. The total left ventricular work is therefore shared, and either the donor or the patient heart may handle most of the load.

The two hearts beat totally independently of each other, so the pulse is composed of a mixture of beats, some resulting from the activity of the donor and some from the patient's own