

or duodenal ulcer complain of the same symptoms. There are those who would disagree with the statement that the pain "does not show periodicity over weeks or months like a peptic ulcer," and it is interesting that during a long remission of symptoms an oesophagoscopy examination will show the mucosa to be just as inflamed and ulcerated as at other times. Although it is true that we still do not know "how common oesophagitis is, how often it exists without symptoms, or how often symptoms mean oesophagitis," patients suffering from oesophagitis are being so thoroughly investigated in many centres to-day that statistics will soon be available. In the meantime Allison¹ has given some idea of the position. He found that, of 176 patients with sliding herniae, 63 had chronic oesophageal ulcers with stenosis, 73 had macroscopic superficial oesophagitis with ulceration, 21 had no visible oesophagitis, and in 19 the findings were indefinite. The treatment of reflux oesophagitis is surgical and, as Harman emphasizes, "should be based entirely on the severity of the symptoms," though he would no doubt agree that this should include also a consideration of the certainty with which surgeons can promise success. If the record of such easily assessable treatment as that of inguinal and femoral hernia is any guide to what may be expected in the surgery of diaphragmatic hernia, treatment of oesophagitis will be in a confused state for some time. Perhaps it is a forewarning of the arguments to come that Harman, in suggesting resection for peptic stricture of the oesophagus, says, "The stomach must not be drawn up into the thorax, for this again leaves the patient with the stage set for return of the trouble"; but he adds that a tube made from the greater curvature of the stomach may be tried. It may be some time before a satisfactory equilibrium is established between the surgeons who bring the stomach, or part of it, up into the mediastinum and those who push it down into the abdomen. The conflict has been by-passed by those who use jejunum for reconstruction.

EPIDEMIOLOGY OF HYPERTENSION

Hypertension remains among the least understood of the major afflictions of Western man. In an admirable review published in our opening pages this week Professor J. McMichael surveys the methods of treating this common condition. No one knows how many people are hypertensive, but with over 40% of our population above 40 years of age there must be hundreds of thousands, if not millions, of men and women with pressure readings temporarily or permanently higher than is now considered

"normal." Very large numbers, too, must suffer and die of the cardiac, cerebral, or renal complications of hypertension—although, because death certificates are clinically incomplete records, we do not know the prevalence even of these gravest manifestations of the disease. The origins of high pressure are virtually unknown—"essential"—despite a most intensive series of laboratory researches in recent years. A forthcoming bibliography on blood pressure from Columbia University promises to list "18,000 articles in 20 languages." Yet, the dangers of obesity apart, there is nothing on which to base a realistic policy of prevention. In the circumstances it is not surprising that there is growing interest in the possibility of an epidemiological approach to the problems of hypertension, as of other chronic diseases whose causes are unknown, a subject we referred to recently¹ in connexion with coronary heart disease in medical practitioners.

The epidemiologist studies a group, and the questions that he often puts may be phrased—who, in which circumstances, develops what? On hypertension he might expect answers to *who*, in terms of such variables known (or suspected) to be relevant as sex, age, heredity, physique, habits, personality structure, and modes of physiological response to stress. Under *circumstances* might be considered physical, nutritional, occupational, economic, and psychological environments. *What* sort of hypertension might mean only high pressure readings, or symptoms, complications, or death from hypertension and its associated disorders. In the United States of America long-term epidemiological and analogous inquiries are already in operation. Under the auspices of the U.S. Public Health Service, and with the co-operation of the State Health Commission and of the local profession,² about two-thirds of all the men and women aged 30–59 years in the town of Framingham, Massachusetts, roughly 6,000 altogether, are being given an exhaustive historical and physical, though rather disappointingly slight psychological and social, examination as a base-line for what is intended to be a 20-year follow-up study. The investigators hope to clarify the beginnings of hypertensive, coronary, and other cardiovascular diseases of middle age in a "normal" population of sufficient size. A special staff has been organized, "including the examining physicians; a clinic nurse; x-ray, electrocardiography, and laboratory technicians;

¹ *British Medical Journal*, 1952, 1, 535.

² Dawber, T. R., Meadors, G. F., and Moore, F. E., *Amer. J. publ. Hlth*, 1951, 41, 279.

Thomas, C. B., *Bull. Johns Hopk. Hosp.*, 1951, 80, 419.

⁴ *Circulation*, 1952, 6, 215.

⁵ *A Symposium on Essential Hypertension—An Epidemiologic Approach*, 1951, Boston.

⁶ *British Medical Journal*, 1952, 1, 503; *Lancet*, 1951, 1, 1, 69.

⁷ *British Medical Journal*, 1952, 1, 808.

statisticians ; interviewing and administrative clerks ; a health educator ; and visiting consultants in the field of cardiology, electrocardiography, roentgenology, pathology, and biochemistry." It is estimated from a sample study that roughly 5,000 subjects will be free from recognizable cardiovascular disorder at the time of the initial examination, and that about 400 of the 5,000 may develop something within five years. Interesting results should therefore begin to be available soon.

At Johns Hopkins the department of preventive medicine³ is making use of the well-known fondness of doctors for their alma mater to start what is intended to be an even longer cardiovascular follow-up. Medical students are being subjected to a very elaborate inquiry with "detailed hereditary studies ; studies of the cardiovascular system at rest and under stress (cold pressor test, exercise test, controlled anoxaemia test) ; studies of metabolic patterns (diet, nutrition, blood cholesterol, circulating eosinophils, acute sodium withdrawal) and studies of personality (habit survey, family data, Rorschach test)," and they will be followed for years after qualification.

This type of investigation owes much to epidemiological work previously done on other diseases, and it combines advantages of the laboratory, the bedside, and the population study. It has already been found that the circulations of far more of the students with some parental history of hypertension and coronary disease are particularly reactive to exercise than is the case in those with a negative family history. Further, those with such a parental history have different patterns of *nervous* response to stress from the others. Ancel Keys and his group in the Laboratory of Physiological Hygiene at Minneapolis are also conducting a functional and pathological cardiovascular investigation of a special "normal" population—some 300 white-collar, middle-class men—and some have now been followed for four years. First results are beginning to be published.⁴

A conference at Boston was called last year by the Commonwealth of Massachusetts, and the School of Public Health and the Bureau of Applied Social Research of Columbia University, to launch a still further epidemiological survey on the problems of hypertension. The report⁵ of the meeting opens with an account of the present state of our knowledge in an illuminating series of papers by some of the leading American authorities. It is hoped that medical and social scientists can jointly carry out a long-term community study, to provide facts on such matters as the definition of "essential" hypertension, the prevalence of hypertension by race and age, the

natural history of the disease in man, the significance of the prehypertensive state, and blood-pressure levels in relation to pregnancy, injury, infection, work habits, and major psychological trauma. The approach is perhaps too closely restricted to hypertension ; clinical experience would certainly indicate equal attention at the same time to its partner in pathology, atheroma.

In Britain the National Health Service should offer opportunities for the conduct of such studies of the natural history of disease in populations. As Morris and his colleagues have pointed out,⁶ simple methods and small numbers may be sufficient to give worth-while results. If a number of factors are involved in the beginnings of hypertension the epidemiological approach might be particularly useful. The Department of Health for Scotland, which is showing such a lively interest in the problems of coronary disease,⁷ may well be able to set an example by initiating field studies of hypertension also ; and the hopes of Sir James Mackenzie, who founded the Institute for Clinical Research at St. Andrews, may yet be fulfilled.

THE GROWTH AND DEVELOPMENT OF CHILDREN

The methods of studying growth and development are at present in the melting-pot and there is great need of some new moulds into which to pour the fresh material. The volume of a child's body, its surface area, the changes in biochemical substances, and the function of the endocrine glands may all have to be taken into consideration. Tanner,¹ in a stimulating discussion of the assessment of children's growth and development, emphasizes the complexity of the subject and puts forward constructive ideas about the future handling of data. Physiologists, psychologists, and biochemists are all interested in growth and in seeing that information about it is collected in the right way. But it is those in charge of the health of children who particularly want to know : Is this child growing normally ? The attempt at the answer to this question forms the major part of Tanner's paper. Standards of so-called normal children's measurements are needed for the assessment of children's growth. These can be obtained in two ways : either by measuring large numbers of children at various ages, or by regularly taking the measurements of the same children over, ideally, the period of birth to maturity. The first method provides information about how far "normal" children have developed by a certain age—in other words, it is a "distance study." The second method—a "velocity study"—shows how much a child has grown in, say, the last year. The information given by finding out the child's velocity of growth is probably more useful than that given by comparing its measurements at any given age with those of other children at the same age.