

dated, there are hopes that the practical aspects, such as wound healing, will be advanced by this work.

The metabolic fate of vitamin D, deficiency of which causes rickets, is being investigated in rats using preparations of the vitamin labelled with tritium. The very high specific activity of these preparations makes possible detailed investigation of the metabolic transformations of the very small quantity of vitamin D that the rat metabolizes. The fate of the vitamin has been found to involve three processes: first, esterification with fatty acids, which may be a storage function; second, inactivation by the liver which breaks down the vitamin for excretion; and third, an active metabolite may be formed, with a function which is so far unclear.

PUBLIC HEALTH

Hazards of Obesity

from a Correspondent

THOSE who attended the Obesity Association's symposium on medical and scientific aspects of obesity held at the Royal Society of Medicine on October 19 can be left in no doubt that obesity is now a major public health problem that urgently requires medical and scientific attention. Both Professor Butterfield (Guy's Hospital) and I. McLean Baird (West Middlesex Hospital) pointed out the difficulties in defining the size of the problem, but conservative estimates put about half of the population above their "desirable" weight.

There is every indication that the incidence of obesity will continue to increase, for childhood obesity is becoming more prevalent and, as J. K. Lloyd (Institute of Child Health) pointed out, 80 per cent of obese children become obese adults. The influence of intra-uterine and post-natal nutrition seems to be profound and could predispose the infant to obesity in later life.

In contrast to this, J. T. Silverstone (St Bartholomew's Hospital) showed that obesity tends to be most prevalent among women over 40 from the lower classes. In psychological terms those people who become obese gradually as they approach middle age usually adapt to their condition, while those becoming obese at an earlier age (particularly adolescents) tend to be vulnerable and can become neurotic. For this reason there could be psychological risks attached to the treatment of these people for their obesity.

Until recently, clinicians and most human nutritionists were all agreed that obesity was a result of gluttony and consequently the cure should be starvation or semi-starvation. Professor Kekwick (Middlesex Hospital), however, warned that our knowledge of energy metabolism is not as complete as adherents of this point of view would suppose. This was amply demonstrated by D. S. Miller (Queen Elizabeth College), who provided substantial evidence for the ability of lean individuals to dispose of excess calories by increasing heat production (that is, thermogenesis). In view of this, he proposed that a thermogenic defect could underlie the development of obesity and stated that a search has been started for thermogenic agents to be used in the treatment of obesity. This theme was taken up later by P. Turner (St Bartholomew's Hospital), who, starting from a consideration of various drugs which suppress appetite, pointed out that some of

them have the additional property of stimulating peripheral metabolism. He suggested that development of this class of drug holds promise particularly because they are devoid of central stimulant activity.

In a review of dietary aids to slimming, A. N. Howard (University of Cambridge) concluded that the low carbohydrate with high protein regimen was probably the most effective, practical and inexpensive. In his opening remarks Professor Yudkin (Queen Elizabeth College) had reported that people on a low carbohydrate regimen ate a diet complete in all respects and, if anything, nutritionally better than their normal diet. This should allay the fears of those nutritionists (principally American) who have discredited the diet on the grounds that it could lead to dietary deficiencies of some nutrients.

P. Lebon, speaking for the Obesity Association, described the enormous difficulties in obtaining recognition of obesity as a major health hazard and in obtaining financial support for research. It is hoped that the Obesity Association and all those connected with research into obesity will gain recognition of their efforts soon.

CRYSTALLOGRAPHY

Structures for making Chemicals

from a Correspondent

ON September 24, the Chemical Crystallography Group discussed "The Applications of Crystal Structure Analysis in Synthetic Chemistry" during the Chemical Society's autumn meeting. Topics included natural products, organic, organometallic and coordination chemistry, all with emphasis on collaboration between synthetic chemists and crystallographers.

With the advent of automatic methods for collecting observations and the widespread use of computers, analysis of crystal structure is becoming sufficiently rapid to supplant total synthesis as the ultimate proof of structure, particularly of natural products. Collaboration is required to produce suitable heavy atom derivatives for crystal structure analysis and to ensure that the reactions have not produced rearrangements. Use of direct methods not requiring a heavy atom is likely to increase for this reason, and an example was given by J. Iball and W. D. S. Motherwell of the elucidation of the structure of an amazing compound, 1,3' : 1,3-di-epoxy-3,3'-diphenyl-2,2'-bi-indolinyll, the product of reaction between phenylacetylene and nitroso benzene.

Several speakers mentioned R. B. Woodward's synthesis of cephalosporin, in which crystal structure analysis was used as a tool to check structures of intermediates. Similar work on protostephanine and aconitine as part of a study of the biosynthetic pathway was described by G. Ferguson in a paper with nine authors from Glasgow University. One paper was remarkable, not only for the quality of the work, but because the author, J. A. D. Jeffries, had isolated the alkaloid peroloryne from a small haystack of rye-grass, carried out a crystal structure analysis, and synthesized the base and two derivatives, to check that the isolated compound was not an artefact of the working-up process. Another natural product, decaprenoxanthin, the first C₅₀ carotenoid, is the subject of international collaboration between Queen Mary College, London, and New Mexico State University; attempted synthesis awaits