

accumulated experiences of a lifetime be invoked as the determining or generating factor of the unique self, though naturally they will enormously modify all the qualities and features of that self. He goes on to say that "it is important to recognize that in the first instance this question of the relation of a self to gene combinations can be asked only by an experiencing self of its own existence. For example, I can ask it in relation to my own self, and I reply that I must face up to the problems of my own personal existence as an experiencing self that is dependent on the functioning of a brain, which I try to understand as a biological mechanism; and that my brain has had a biological origin as a consequence of a gene combination and the ensuing embryological development. My experiencing self is the only reality I know by direct apprehension—all else is second-order or derivative reality. The arguments presented by Jennings preclude me from believing that my experiencing self has an existence that merely is derivative from my brain with its biological origin, and with its development under instructions derived from my genetic inheritance. Nor do I believe with the physicalists that my conscious experiences are nothing but the operation of the physiological mechanisms of my brain. It may be noted in passing that this extraordinary belief cannot be accommodated to the fact that only a minute amount of cortical activity finds expression in conscious experience. Contrary to this physicalist creed, I believe that the prime reality of my experiencing self cannot with propriety be identified with some aspects of its experiences and its imaginings—such as brains and neurones and nerve impulses and even complex spatio-temporal patterns of impulses. The evidence presented in this lecture shows that these events in the material world are a necessary but not sufficient cause for conscious experiences and for my consciously experiencing self".

W. H. THORPE

## DIET AND DENTAL DISEASE

### Nutrition and Caries-prevention

Edited by Gunnar Blix. (Symposia of the Swedish Nutrition Foundation, No. 3.) Pp. 130. (Stockholm: Almqvist and Wiksell, 1965.) 35 Sw.kr.

### Caries-resistant Teeth

Edited by G. E. W. Wolstenholme and Maeve O'Connor. (Ciba Foundation Symposium.) Pp. xii+338. (London: J. and A. Churchill, Ltd., 1965.) 60s.

THE notion that the form and structure of the teeth, and consequently their resistance to disease, might be influenced by the nature of the diet has long been one that has had many attractions for clinicians and research workers alike. With the familiar examples of pathological changes in bone and other tissues resulting from prenatal and postnatal variations in nutrition, it has seemed natural to assume that the principal dental disease, dental caries, might also be related to dietetic factors. This, of course, has proved to be the case, but not quite in the way expected by some of the earlier researchers. They had felt that nutritional deficiencies might well produce structural defects in the developing teeth of such a kind that susceptibility to caries would be increased. This would be comparable to the increased susceptibility to disease, for example tuberculosis, that is shown by other tissues under conditions of dietary deficiency. However, there is much evidence to show that perfect tooth structure is not essential for resistance to caries and, indeed, lifelong immunity to the disease may be exhibited in the presence of comparatively gross structural defects, and in conditions of severe malnutrition. In fact, caries is more prevalent in well-nourished individuals, and is particularly a disease of populations whose standards of living are relatively high. Thus we have what once would have seemed a completely paradoxical state of affairs, that those

most susceptible to disease appear to be those who are best nourished. However, the light shed by geographical pathology and epidemiological methods on the incidence of cardiovascular disease and its relationship to diet, on periodontal disease as well as on caries and on other conditions, is bringing home to us, though expressed nowadays in modern and more scientific terminology, the truth of our forefathers' belief that one can dig one's grave with one's teeth.

In *Nutrition and Caries-prevention*, the whole subject of the influence of the diet on caries-susceptibility and resistance is very fully discussed. The book is the record of a symposium sponsored by the Swedish Nutrition Foundation, the range of topics covering practically every aspect of the relationship of diet to caries, including the effect of general nutrition on tooth formation and on the saliva and the oral flora, the local effects of nutrition, the effect of additives to foods and the effects of fluorides both in foods and in water.

The Ciba Foundation's *Caries-resistant Teeth* is another symposium, with a closely related content. Here again, the tantalizing question of individual resistance and susceptibility to disease is posed. Why do the teeth of some people suffer from rapid decay, while those of others, living under apparently identical conditions, seem to be extremely resistant? The effect of diet is discussed, though not of course as extensively as in the previous volume. Other topics dealt with include the role of heredity in caries resistance, the physical and chemical constitution of caries-resistant teeth, including their ultrastructure, the effect of trace elements, the role of bacteria and of saliva, and caries resistance in experimental animals.

In both symposia the participants are experts of international reputation. The papers are well documented and full references are given. The discussion following each communication is also reported. The final result is that these two volumes, though quite independently produced, are in fact complementary, and together give an up-to-date, comprehensive and authoritative account of resistance and susceptibility to the commonest chronic disease of man.

R. B. LUCAS

## "FRESH AND DRAMATIC"

### Research Problems in Biology

Investigations for Students. Series 1. Pp. xxxiii+232. Series 2: Pp. xxviii+240. (Prepared under the direction of the American Institute of Biological Sciences—Biological Sciences Curriculum Study.) (London: George G. Harrap and Co., Ltd., 1965.) 16s. each volume.

THE biological world is watching the birth pangs of a new stage in school science. If the parents of this scion, so to speak, are the mid-century centres of biological interest and a coolness towards didactic methods, then the midwife is the pressure of practical developments over the whole range of medicine, agriculture, human biology and a considerable proportion of industry. The new concepts growing out of the interaction of all scientific disciplines rest on the labours of our nineteenth-century post-Darwinian scientific ancestors, and have perhaps few but significant origins in the past half-century. DNA was recognized in 1880, Tansleian ecology emerged in the first 20 years of this century, Mendelism only became current coin after 1900 and electron microscopy since about 1940.

It is against the background of these events that the new teaching has to be evaluated, and since 1958 there have been serious attacks on both the contents of courses and the ways of conducting them. What should schools do? Their responsibility for preparing children for adult life forces them to view science as but one of a number of factors concerned. A fundamental problem is to decide