

are thus open to detection by chemical or biological tests. Interest in these tumours is consequently shared by physiologists and clinicians. *Human Tumours Secreting Catecholamines* deals with the pheochromocytomas; the adrenaline and noradrenaline secreted in more than normal amounts produce effects in the human body which are familiar to the physiologist from his animal experiments, and which assist the clinician in diagnosis. It is thus appropriate that this investigation should be the result of collaboration of a physiologist and a physician. It represents about 30 years of investigation of the subject in the School of Medicine at Lyons. The authors have collected details of more than 500 published cases, and the various aspects discussed are illustrated by reference to appropriate patients.

The most obvious manifestations of these tumours are cardiovascular, with paroxysmal or sustained hypertension, as might be expected from the hypertensive action of adrenaline and noradrenaline. Hypertension is such a common symptom that the difficulty is to detect the relatively small number of cases in which it is due to a tumour of chromaffin cells. There are excellent chapters dealing with the various manifestations, cardiovascular, metabolic, and endocrine; and unusual clinical forms, for example, asymptomatic cases in which the adrenomedullary tumour may remain latent throughout life, only to be discovered at operation or autopsy. These tumours of chromaffin tissue may be single or multiple, confined to the adrenal medulla or ectopic (developing from embryonal rests); all these are well described in the chapter on anatomical forms. The most important chapter is that on diagnosis, an aspect which is often difficult because of the diverse symptoms produced by the tumour.

Profs. Hermann and Mornex stress the importance of interrogation and clinical examination. But from their experience of a large number of urinary catechol estimations, they are struck by the number of cases in which the clinical diagnosis of a tumour has to be rejected on the laboratory evidence. This is a general experience of those carrying out tests. The authors point out that no single technique is sufficient for complete investigation; they favour the estimation of urinary catecholamines, first by a biological method using dogs, followed by chemical methods for vanillyl mandelic acid or other methoxylated derivatives, and for the most accurate estimations the fluorimetric (trihydroxyindole) method.

Pathological anatomy, biological investigations, and physiopathology are dealt with in the concluding chapters. One would like to have seen more mention of the neuroblastomas, the other human tumours that secrete catecholamines. The 500 cases are listed in a table, with references, and all statements are supported by references to the literature contained in a bibliography of 800 papers. By contrast, the subject index is so brief as to be of little value. The translation reads well. This book is a most excellent and comprehensive treatment of the subject.

A. B. ANDERSON

VITAMINS AND COENZYMES

Vitamins and Coenzymes

By Dr. Arthur F. Wagner and Dr. Karl Folkers. Pp. xvi + 532. (New York and London: Interscience Publishers, a Division of John Wiley and Sons, 1964.) 132s.

THIS volume, which derives from the extension of a chapter on vitamins in the second edition of *Medicinal Chemistry* (Burger, 1960), is introduced by a discussion of the evolution of the vitamin theory—appropriately headed by Sir Frederick Gowland Hopkins's comment: "No general or widespread belief in the view that an adequate diet must contain indispensable constituents other than adequate calories, a minimum of protein, and

a proper mineral supply, could be said to exist until the years 1911–12". After the historical introduction, the known activities and the nomenclature of vitamins are outlined before the main thesis of coenzyme connexions is explored. The earliest recognition of coenzymes related to vitamins was in the investigation of thiamine metabolism and of cocarboxylase. The consideration of coenzyme activity is preceded in the chapter on thiamine, as in succeeding chapters, by an account of the isolation, chemical identification and synthesis or biosynthesis of the vitamin. Nutritional and therapeutic investigations in animals and man are included as a final section for every chapter.

Within the framework thus designed, a useful and comprehensive account is given of many highly diverse biological systems. The vitamins of the B complex participate in many enzyme groupings and work in the field of B vitamins has been the main source of the expanding knowledge of coenzyme structures and activities. The original naming of diphosphopyridine nucleotide and triphosphopyridine nucleotide as coenzyme I and coenzyme II is an example of the basic importance of B vitamins in the coenzyme field. With the recognition of the role of pantothenic acid as an integral part of the universally important coenzyme A, a further wide field of metabolic investigation was opened in physiology, medicine, nutrition and microbiology. With pyridoxine and cocarboxylase, another step was taken towards the elucidation of the biochemical mechanisms essential to life from the cellular level up to the higher organisms. Biotin, which for many years was mainly investigated in relation to so-called "egg white injury" and then as a bacterial growth factor, has now emerged as an essential part of the "activated carbon dioxide" in the acetyl coenzyme A carboxylase system.

Folic acid and its array of derived pteroylglutamic compounds is another important field and so is cyanocobalamin with cobamide coenzymes related to vitamin B₁₂. The chapter on lipoic acid is very useful since it is not easy to find a full and satisfactory account of this recently discovered factor elsewhere in the literature.

For the fat soluble vitamins there were few clear coenzyme connexions known until the discovery of coenzyme Q or ubiquinone related to vitamin A. The review of the ubiquinone group provides a good final chapter to round off a valuable contribution to the biochemistry bookshelf. Though the emphasis of the material is essentially biochemical, the nutritional and therapeutic roles of vitamins and coenzymes are discussed so that *Vitamins and Coenzymes* serves as a reference source for many disciplines.

The way in which chemical and structural formulae are presented is very good. The book can be recommended for advanced biochemical teaching though it is probably too chemical for medical students. For biochemical and nutritional research it is invaluable, since it covers most recent literature and presents a balanced review of the vitamin field. As the authors state in their preface, omission of material inevitably occurs, deliberately or inadvertently, but the whole picture is undoubtedly well conveyed.

A. M. COPPING

THEORY AND PRACTICAL IMPLICATIONS OF QUANTITATIVE INHERITANCE

Quantitative Genetik

Von Gunnar Eilert Hiorth. Pp. viii + 467. (Berlin: Springer-Verlag, 1963.) 86 D.M.

QUANTITATIVE Genetik covers the theory and practical implications of quantitative inheritance, and students with a moderate knowledge of German will