These, however, are some of a legion of thoughts arising from Dr. Watson's book rather than criticisms. No doubt all its deservedly many readers will be similarly stimulated, and many postgraduate research workers will be grateful for the fruitful leads which the author supplies.

C. C. TOWNSEND

WHAT IS COMPARATIVE ENDOCRINOLOGY?

Comparative Endocrinology

Vol. 2. Edited by U. S. von Euler and H. Heller. Part 1: Invertebrate Hormones. Part 2: Tissue Hormones. Pp. xiii + 282. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1963.) 86s.

IN reviewing Volume 1 of *Comparative Endocrinology* (*Nature*, 201, 120; 1964) I emphasized the exciting phase into which the subject has now entered, but pointed out that it has not, in Britain, yet gained that recognition which is its favoured lot throughout the world. However, this comment does not apply to insect endocrinology which, largely due to Sir Vincent Wigglesworth, has been a recognized and dynamic field for three decades or more. It was the more surprising and disappointing to find that Part 1 of Volume 2, "Invertebrate Hormones", occupies only some 62 pages.

In the first section, L. I. Gilbert considers "Hormones Controlling Reproduction and Molting in Invertebrates". He deals mainly with arthropods and particularly with the insects. Crustacea are cursorily dismissed in five pages. In the part on insect metamorphosis, the Holometabolous insects are emphasized to the almost complete exclusion of the Hemimetabola. The text arouses the curiosity, but by lack of information fails to satisfy it. For example, "... thorough study of the subspiracular glands in the *Cecropia* silkworm during all stages of development and obtained evidence of secretion at several critical stages". The nature of the studies is not described, nor are the critical stages given. The addendum is very scrappy and incomplete and should not, in any event, occur in this type of treatise. As a whole, instead of being a critical synthesis of the present state of knowledge, this part is a collection of selected findings from which the reader will have difficulty in discerning any emergent pattern. The second part, which includes insects and is a description of gross structure of neuro-secretory systems by F. G. W. Knowles, is too short and superficial to be of any real value.

Part 2 comprises a miscellaneous collection of articles, including those on kinins, heparin, lipid anions, 5-hydroxytryptamine, cholinergic and adrenergic neurohormones and histamine. Whether all these varied compounds should be classed as endocrine is in doubt and certainly not enough is known to justify their presence in "Comparative Endocrinology". It is the strength of the comparative approach that a variety of animals, especially those below the sub-class Eutheria, can be considered. By so doing, light is thrown on fundamental processes of wide applicability, in animals wherein there is greater ease of access and fewer complicating factors.

A rag-bag of so-called 'tissue hormones', knowledge of which stems almost completely from a few mammalian laboratory animals, certainly makes no contribution to 'comparative endocrinology'. The articles might be considered useful if they urge comparative physiologists to look further. If this were the rationale of the editors it would have been justified if they had been included in Volume 1. As it is, Volume 2 serves comparative endocrinology ill in being neither particularly comparative nor unequivocally about hormones.

I. CHESTER JONES

NUCLEAR PHYSICS

Progress in Nuclear Physics

Vol. 9. Edited by Prof. O. R. Frisch. Pp. v + 310. (London and New York: Pergamon Press, 1964.) 90s. net.

THIS ninth volume deals with a variety of detection methods and with theoretical and experimental investigations, mostly, but not wholly, in the field of high-energy physics. Though research, in most of the matters considered, is still moving fast, a great deal of data exist, and the present book provides valuable information on the subjects considered.

The first two articles are devoted to electronic methods of particle detection, namely, "Spark Chambers" by J. G. Rutherglen, and "Semiconductor Counters" by G. Dearnaley. In the former the mechanism of spark production is fully discussed. A short description of some of the essentials of spark chamber operational techniques follows, and a number of valuable references are given for those wishing to set up complete systems. Of particular interest is the account given of the effects of clearance field on spark alignment, and of the assessment of track accuracy. In the second article the essential characteristics of the depletion layers of semi-conducting counters are outlined. The relative merits of this type of counter are well exemplified, in particular the energy measurement of short-range, slowly moving and heavily ionizing particles. Some of the disadvantages are also referred to, such as the very high noise background, experienced in fast rise time work, and the methods of combating this by fast-slow coincidence methods.

Then there is an article on "Theoretical Techniques of High Energy Beam Design" by N. M. King. It is often difficult to have at one's disposal a physical account of the principles of beam design, since beam design manuals often list only the computational parameters. This article provides such a physical description admirably. Details are given of the trajectories and phase space parameters of the particle beams for quadrupole and main bending magnets, and of fringe field effects. The properties and difficulties of electrostatic separators are outlined.

The "Introduction to the Structure Analysis of Collision Amplitudes" by R. J. Eden deals with the development of dispersion theory and the relation of its singularities to perturbation theory. Starting with derivations from causality, it leads to a discussion of the analyticity properties which hold in collision problems. Some of these sections may not be found easy, as the author himself seems to fear, but there are many references available. Two important interaction problems are helpfully mapped out and provide some of the underlying steps of a full analysis. The role of Regge poles in asymptotic behaviour is briefly indicated.

This is followed by a detailed 100-page article on "The Interaction of Strange Particles with Nuclei" by E. H. S. Burhop, D. H. Davis and J. Zakrzewski. A valuable introductory account is given on the interactions of kaons and hyperons with nucleons, and on mesic capture. The generalizations made to nuclei provide data on neutron reactions and, of particular interest, on those yielding Y particles among the final states. But in the presence of the other nucleons, other processes such as internal absorption can intervene, and these are detailed. Hyperfragments are discussed separately and a useful short analysis is given of Λ -nucleon binding forces.

Finally, there is the article on "Electromagnetic Properties of the Muon" by F. J. M. Farley. It is a very comprehensive and exciting story of recent electromagnetic measurements leading to definite specifications of the spin, mass and, particularly, the magnetic properties of this particle, and raising throughout the intriguing question of muon-electron differences.