

chemistry to the study of disease, and the introduction of an experimental and quantitative approach to clinical problems. The human mind, however, . . . had not been similarly explored and it was chiefly through the lack of suitable methods of research that psychiatry had lagged behind". This is an interesting statement because it reveals an unawareness on the part of the author that many experimental and quantitative methods for the study of the mind have in fact been developed by psychology, and that the failure of psychiatry to become scientific has been largely due to the fact that these methods have not been applied.

Groen and his colleagues have tried hard to overcome the difficulties of their task, and to apply experimental and quantitative methods, but they have done so only in a half-hearted manner, and the level of the work is not always as high as it should be. Sometimes, as for example in the study by Valk and Groen on the electric resistance of the skin during induced emotional stress, the statistical treatment of the data is too tenuous to be acceptable, the experimental arrangement is rather primitive, and much of the argument is rather anecdotal. It is true that the research was done more than fifteen years ago, and that it would have been nearer the average standard of experimentation than it would now, but in a book published in 1964 one must judge the contents in terms of the present level of sophistication. In another paper, Barendregt has studied the effect of group psychotherapy by using the Rorschach test, which in spite of the ingenious way in which he has managed to overcome some of the inherent difficulties and subjective weaknesses of this projective device can scarcely claim to be an appropriate tool for experimental analysis. In addition the statistical argument presented is faulty; three hypotheses are tested of which two are clearly insignificant even on a one-tailed test. One is barely significant at the 1 per cent level on the one-tailed test, but being one out of three must be regarded as not supported by the evidence. Barendregt quite incorrectly combines the *P* values for all three hypotheses and arrives at the conclusion that his data reject the null hypothesis.

It would be wrong to conclude that there is nothing of interest in this book. Groen and his collaborators have tried hard to lift the subject of psychosomatic research from the quagmire in which psychoanalytic speculation has landed it, and many of their investigations are intriguing and suggestive. It is questionable whether they are important enough to merit resurrection and publication in book form at the rather high price of 80s.; it seems likely that only specialists will feel that whatever the price this book is essential to them.

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## UNCONTROLLED INSECT PHYSIOLOGY

### The Physiology of Insecta

Vol. 2. Edited by M. Rockstein. Pp. xvi+905. List Price 235s.; subscription price 211s. Vol. 3. Pp. xiv+692. 178s. 6d. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1964.)

THESE two weighty volumes complete Rockstein's book on *The Physiology of Insecta*, the first volume of which was published in 1964 (*Nature*, 205, 116; 1965). I cannot claim to have read the 1,600 pages in the critical manner which would have been a pleasure with a shorter book; but the same difficulty has beset the editor, who has failed adequately to collate the various contributions. This shows itself most obviously in the index, which not only mis-spells the names of many insects, but often lists the same insect under two generic names. There is no indication that *Anagasta* is the same insect as *Ephestia*, *Lucilia* the same as *Phaenicia* and so on. In the text identical data for a species are quoted twice, under differ-

ent names, and the larva and adult of the same species are under different genera in the same table (Volume 3, p. 116, Table 1). One author, whose name is unaccountably printed in italics in the text, has also been elevated to insect rank and appears with them in the index to Insecta. Indexing deserves more serious consideration than this if a work is to be used for handy reference. Separate indexes to authors, insects and subjects are a good feature; a combined subject index in the last volume would have partially overcome the disadvantages of the awkward subdivision of the work. It is a pity that the bibliographies do not include titles: the time saved the reader justifies the increased cost.

The editor has grouped his subjects into three sections, which unfortunately do not match the volumes. Biology, development and ageing (Section A) was finished in Volume 1, which also had seven chapters from Section B on the insect and the external environment. Volume 2 completes this part with six further chapters. Markl and Lindauer consider insect behaviour in 130 pages, of which as many as 50 are devoted to the mechanism of orientation. Lindauer then follows this with 65 pages on social communication. The chapters on migration by Johnson, terrestrial locomotion by G. M. Hughes, swimming by Nachtigall and flight by Pringle are all much shorter.

Section C, "The Insect and the Internal Environment—Homeostasis", has eight chapters in Volume 2 and eleven in Volume 3. Huber writes on neural integration and Graham Hoyle discusses the neural control of skeletal muscle. Hoyle's Fig. 1a on p. 410 is quite unnecessarily repeated by Maruyama on p. 453 in an article on the biochemistry of insect muscle. Maruyama apologizes for not discussing the controversial topic of the mechanism of muscular contraction.

Sacktor's 100-page chapter on the energetics and metabolism of muscle uses, without any explanation, all the usual biochemist's abbreviations for the many substances which come into his story. This seems unwise if the book is to be useful to the general reader. Chefurka follows in a similar vein with two long chapters on the metabolism of carbohydrates, nitrogenous and lipid compounds. House completes a useful account of nutrition and digestion in less than a hundred pages.

Volume 3 deals with various aspects of blood in three chapters by Jones, Florin and Jeuniaux, and Grégoire. There is an informative chapter on salt and water balance and excretion by Stobbart and Shaw. Briggs writes on immunology and Perry on insecticide resistance. Locke, Hackman and Ebeling have three chapters on the cuticle. All use data from Baker's study of the waxes of the Mormon cricket. Ebeling quotes this in detail in his text and the other two each have tables summarizing it to different degrees. The work ends with two chapters on respiration by Miller and by Keister and Buck.

Most of the illustrations are good and some useful new diagrams are included. Some have been reduplicated and some (for example, Volume 3, p. 30) show nothing and should have been replaced by drawings.

The book is extremely patchy. Contributors cannot have seen the chapters by their co-authors on closely related topics. The duplications and omissions show that the editor has exercised quite insufficient control. The work as a whole has the character of *Recent Advances in Insect Physiology*. It cannot stand as a definitive text of reference. Even though many of the articles are individually excellent they do not between them cover the field adequately.

A book of this length and character cannot be recommended for student reading. Research workers whose interests are covered by one or more chapters will find it helpful. The articles would, however, have been more useful separately than bound up in these three volumes, which together weigh 9.5 lb.

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