

completes the chapter on the Foraminifera. This should be useful to research workers dealing with original papers, but the transliteration of the Russian terms mean that it has lost some of its value. The other microfossils are discussed in a much less exhaustive manner than the Foraminifera, for example, only the orders, suborders and superfamilies of the Radiolaria are described, and only the Tintinnina and the Hystriospheres are treated generically.

The complete bibliography of seventy-five pages is generally adequate up to 1956, but since the more recent literature is not included, the book is already seven years out of date. One strong point, however, in favour of the work is the inclusion of numerous Russian references in the bibliography. These are not to be found in any comparable text-book in English.

In comparison with the German edition, the present edition is rather poorly bound and more bulky, with an extra seventy-two pages; typographical errors are frequent and there is a loss of quality in the half-tone illustrations. In spite of the fact that there are defects and omissions the book reveals the author's careful attention to his principal object, which is the lucid presentation of a large amount of factual material.

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also includes a list of journals and review books that are related to the subject and are published throughout the world. Russian periodicals are included in this list. It is unfortunate that *Clinical Chemistry*, *Clinica Chimica Acta* and *Recent Advances in Clinical Chemistry* are not included in this very comprehensive list. The section concludes with the syllabus of the subject as taught in the author's department. Practical exercises are not included but there are frequent references to and descriptions of specialized techniques such as used in the examination of the structure of proteins, etc. Each sub-section is followed by a series of questions which the reader at his discretion may attempt to answer. The applications of biochemistry to the study of disease, usually considered under the headings of clinical chemistry or chemical pathology, have not been discussed except in the explanation of certain biochemical phenomena.

The subject-matter is rather more than required of the student of medicine in Britain and is probably more suitable for those reading for a degree in biochemistry with a bias towards medicine. The book would be of great value to the student of biochemistry conversant with the German language or one wishing to become conversant not only with biochemistry but also with the German language.

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MEDICAL BIOCHEMISTRY

Medizinische Biochemie

Lehrbuch für Studierende und Ärzte. Von Dr. S. M. Rapoport. Pp. xvi + 992. (Berlin: Veb Verlag Volk und Gesundheit, 1962.) 53 D.M.

THE author of this book is a professor in the Humboldt University of Berlin and is also the director of the Institute of Physiological Chemistry of the Faculty of Medicine. The publication, which is from East Germany, is well printed on good paper and is written in German. The contents of the publication shows meticulous care in preparation and there is a liberal supply of tables, graphs, illustrations and photographs.

The book is divided into four sections. The first section, consisting of 200 pages, is concerned with the dynamic biochemistry of the living organism. As an introduction, the significance of physiological chemistry is discussed and a short historical background is included. The remainder of the section deals with physicochemical problems, the function of water and ions in the organism, proteins, enzymes and the chemistry of the cell. This section contains numerous diagrams, graphs, tables, illustrations and photographs.

In the second section, 336 pages are devoted to the intermediate metabolism of carbohydrates, lipids, steroids, amino-acids and proteins, nucleic acids, and porphyrins and h em compounds. The subject-matter is particularly well illustrated with diagrams, graphs, etc. Reference is made to disease in those cases in which a disorder of metabolism is involved. In the third section, 246 pages are devoted to functional biochemistry. Salt and water metabolism and the influence of hormones are discussed. There are sub-sections on acid-base equilibrium, the composition of blood and the biochemistry of renal and liver functions. The biochemistry of muscle, connective and nervous tissues is discussed. There are also sub-sections on the biochemistry of reproduction, lactation and immunochemistry. The section is well illustrated with diagrams, tables, etc. Reference is made to disease in discussion of some of the biochemical phenomena.

The fourth section deals with problems very largely concerned with nutrition such as mineral metabolism, for example, iron, calcium and phosphorus. There is a large sub-section devoted to the vitamins. The section

BEHAVIOUR OF THE RAT

A Study in Behaviour

Principles of Ethology and Behavioural Physiology, Displayed mainly in the Rat. By S. A. Barnett. Pp. xvi + 288 + 14 plates. (London: Methuen and Co., Ltd., 1963.) 45s.

IN this book Dr. Barnett restricts himself almost entirely to the behaviour of his favourite experimental animal, the rat. It is very useful to have such a study since the rat is by far the commonest item of the fauna of the modern biological laboratory—particularly that of the physiologist and psychologist. But, so far as wider objectives are concerned, the choice of the rat is unfortunate. Although the annual output of papers on this animal, or on some parts of it, is quite overwhelming, it does not provide in itself very convenient material for setting forth the principles of ethology. This is partly because it shares with many mammals the disadvantage of possessing relatively little of the fixed, species-specific, unlearned (instinctive) type of behaviour. Moreover, the author is so careful not to commit himself to any particular series of concepts or definitions of ethology that he tends at times to be confused by his own caution; so one begins to doubt what it is, in a given set of observations or experiments, that he finds interesting or important, and why. Of particular interest are those fields to which the author himself has most contributed, namely the behaviour of the wild Norway rat, the exploratory learning of rats and its psychological significance, and studies on the physiology of the stress which results when a rat is caged in the territory of a rival. Indeed, apparently perfectly healthy rats may die of shock in such circumstances; this lethal shock involves a whole series of neural and endocrine changes associated particularly with the sudden and severe drain on the secretion of the adrenal glands. As to exploratory behaviour, this is a phenomenon found very widely in the animal kingdom, and Barnett has made the particularly important point that exploratory learning in rats, as in the cautious sniffing and exploration of a new cage and new territory, gives the maximum of information about the environment in the safest possible way and thus has important survival value. Perhaps the success and ubiquity of the rat depends as much on this as on any other one factor.