Book Reviews

Protozoologie. Karl G. Grell. Springer, Berlin, 1956. 284 pp. Illus. DM. 59.

In many ways, this is a refreshing treatment of the field of protozoology. Karl Grell has drawn heavily on his own investigations and on modern discoveries of protozoologists, particularly in the United States where he recently spent several months. One result has been that much of the content is new in the sense that it has never appeared previously in book form. The drawings and photographs are particularly attractive; the author has relied heavily on good photographs, and the publisher has apparently spared no expense in insuring the best possible reproduction for the illustrations.

Grell's concept of the Protozoa and his taxonomic treatment of some of the major groups will probably not be acceptable to all protozoologists. I was pleased to note Grell's forthright acceptance of the Protozoa as *unicellular* animals, thereby avoiding the semantic pitfall of those who discuss *cellular* morphology or *cellular* physiology in Protozoa, organisms which they have described previously as being either *acellular* or *noncellular*. The author's exclusion of the entire group of the Cnidosporidia from the Protozoa on the basis of a differentiation among the somatic cells and nuclei, a character absent *by his definition* from other Protozoa, will strike many protozoologists as being somewhat arbitrary, especially in the absence of any elaboration of the statement that they are perhaps degenerate Metazoa.

The classification of the Opalinida as an order of the Flagellata, and of the Hypermastigidae as a family of the Polymastigina might be considered by some to be debatable on the basis of present evidence. The transfer of the Haemosporidia from a separate order to a family Haemosporidae of the Coccidia, on the other hand, is a change which has seemed inevitable following the discovery of the exo-erythrocytic phases of Plasmodium. The formation of a new suborder Eucoccidia to accommodate a single species of sporozoan without schizogony, and the creation of a second new suborder, the Schizococcidia, to accommodate the rest of the Coccidia seems rather drastic, inasmuch as the species in question has gregarine as well as coccidian characteristics.

Grell has the facility of writing simply and of explaining with great clarity. The sections on asexual reproduction, and on fertilization and sexuality are particularly well written. Not all protozoologists in this country are convinced, however, of the existence of sexual processes in a single representative of the Amoebina, *Sappinia diploidea.*

It is to be hoped that protozoologists will some day come to an agreement with respect to the meaning of the term *blepharoplast.* It is used here (pp. 16, 203) as synonymous with the *kinetoplast* as defined by Kirby. Other workers equate it with the basal granule.

A few minor points might be corrected in future editions. The experiments of Taylor would contradict the statement that there is no experimental proof that the longitudinal fibrils of ciliates conduct stimuli (p. 171). On the other hand, there is no published support for the view that the lens of a dinoflagellate "eye" actually concentrates light rays (p. 174). There is considerable recent evidence that the ciliates in ruminants may perform some essential functions for the host, so that they should not properly be described as commensals (p. 187). There is little reason to continue to call the rod-shaped structures of Lamblia (Giardia) parabasal bodies (p. 206), for they show practically no correspondence with parabasals in other flagellates. The name *Plasmodium praecox* (p. 253) is a synonym of *P. relictum.* The method of *Balantidium coli* in attacking the intestine of man is commonly due to the action of the parasite itself rather than to toxic or bacterial injury (p. 265).

The intimate knowledge of the author in certain fields of protozoology has produced a marked unevenness in the topics treated. For example, of the 187 pages set aside for the general treatment of the Protozoa, 140 pages are devoted to the nucleus, asexual and sexual reproduction, and genetics. The result is often a very detailed and highly technical discussion of such topics as chromosome structure and behavior, or of modifications of types of mitosis found in the Hypermastigidae of the gut of the wood roach, while the vacuolar system of the Protozoa, for example, is covered in four paragraphs. Modern studies of protozoan nutrition, furthermore, are practically never mentioned, the role of *Tetrahymena* in this field being referred to in a short paragraph in small type. The phenomena of encystment, of excystment, and of regeneration are hardly mentioned.

Similarly in the treatment of the different groups of the Protozoa, while there are some very beautiful photographs and a highly technical discussion of reproduction among the Foraminifera, covering 12 pages, the ciliate suborders Apostomea and Thigomotricha are dismissed in two and one-half lines.

In a future edition, the addition of a subtitle defining the limited scope of the book would be more accurate than the term *Protozoologie.* Within the bounds he has set for himself, Grell has done an excellent job in presenting in a clear and attractive manner certain aspects of modern protozoology. The listing of recent films dealing with the Protozoa is a welcome innovation.

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Physics, Psychology and Medicine. A methodological essay. J. H. Woodger. Cambridge University Press, London, 1956. 146 pp. $1.75.

J. H. Woodger believes that in the education of British physicians excessive emphasis has been placed on the approach to problems which regards physics as the fundamental discipline. In consequence, graduates of medical schools are not adequately equipped to handle the increasing number of cases of mental illness that they will encounter in their practice. The ostensible aim of this little book is to show the need for a medical training which will recognize the importance of psychology and even of relevant parts of the social sciences.

Most of the book, however, is an elementary account of scientific methodology; and, except for occasional asides, it deals largely with logical and epistemological distinctions that are the stock in trade of beginning courses in these subjects. Woodger explains at some length the differences between statements that are first-person reports of observations (not very convincingly described as statements concerning "feelings in a very wide sense of the word"), generalizations of such statements, and explanatory hypotheses. He notes that the connections of the latter to observation statements are rather loose, and that there is