

Book Reviews

Nonsystematists' Systematics

A Classification of Living Animals.

Lord Rothschild. Longmans, Green, London; Wiley, New York, 1961. vii + 106 pp. \$4.75.

It is notorious that physiologists, biochemists, biophysicists, and other scientists dealing with animals but not directly with systematics have often been vague as to the animals from which their research materials were derived. That was sometimes due to lack of interest, which is now properly considered inexcusable. The results of research are invalid if its materials are not adequately specified and placed in a taxonomic frame of reference. In other instances the fault was ignorance, sometimes excused on the grounds that the needed information was not readily accessible. Lord Rothschild's aim is to meet the latter complaint by providing an outline classification of the whole animal kingdom in one small, convenient volume.

A summary of a little over one page first lists the phyla and a few classes, with estimates of the numbers of known species. The body of the work, in 41 pages, is an outline classification of living groups, only, down to orders and sometimes, where these are in common use, suborders. For each order or suborder, one or more genera are named as examples, to the number of about 2000 in all. Synonyms still in frequent use are given parenthetically. For many genera and a few other groups an English common name is indicated. No other data are included. All names in the classification are indexed. For each common name the genus and order or suborder, as well as the page number, are given, and for each genus the order or suborder and page. The index also includes about 850 genera that are *not* listed in the classification, with page reference to the appropriate order or suborder. The more convenient inclu-

sion of those genera in the classification itself would not significantly have expanded the small book.

The classification depends largely, but by no means wholly, on Hyman for groups so far covered in her great treatise, *The Invertebrates*, and on the various authors of Grassé's *Traité de Zoologie*. Two classifications each are given for the Porifera (one by Burton and one by Hyman), Platyhelminthes (by Baer, hitherto unpublished, and by Dawes), and Nematoda (by Chitwood and Chitwood, and by Hyman). Rothschild has been assisted throughout by a large and distinguished body of British systematists, who are listed in the second appendix. The first appendix gives suggestions for further reading on each major group, and the works cited are listed bibliographically in the third appendix (5 pages).

The nonsystematist workers for whom the book is intended should be warned that this work will not suffice for purposes of their actual research and publication. They are told only that for the approximately 200,000 genera here necessarily unmentioned the most likely place to look is in Neave's *Nomenclator Zoologicus*. They are not told that research materials must be identified to species, at least, and that genera must be placed in families, nor are there any suggestions as to how one goes about this. Not even the *Zoological Record* is mentioned. The reading lists will often serve as a first step toward the necessary details, but often also will not. For example, the 11 citations under Reptilia include two monographs, each on a single genus (both genera unusual and one not included in the classification) but do not include Romer's *Osteology of the Reptiles*, the only work that gives a complete, modern, authoritative classification of all genera of living (as well as extinct) reptiles. As another example (one among many that could be given): the most recent

reference on Amphibia in general is 30 years old; there are no references on urodeles ("Caudata"); and the only reference on anurans ("Salientia") is to a paper on a single species. There is no mention of various textbooks, for example Storer's, that cover the whole field of this outline, that give more useful information, and that are, it would seem, equally accessible to nonspecialists.

Although Rothschild has admirably achieved his aim, it does seem a pity that the aim was quite so limited. With only a little more effort and still within the bounds of convenience and easy accessibility, this fine array of talent could have produced a work even more useful to nonsystematists. The book is nevertheless highly recommended for what it is: a handy, authoritative outline of animal classification, intermediate between a mere listing of phyla and the more extensive technicalities of textbooks, treatises, and monographs.

G. G. SIMPSON
*Museum of Comparative Zoology,
Harvard University*

Nomad and Villager

Prehistoric Man on the Great Plains.

Waldo R. Wedel. University of Oklahoma Press, Norman, 1961. xviii + 355 pp. Illus. \$5.95.

This is not a "popular" book but an annotated text and reference work in which one of the leading students of Plains archeology has effectively summarized the current knowledge of his field. The first part is a review of archeological techniques, the environmental background of the Plains area, and the story of the earliest occupants. Then the prehistoric evidences within each subarea are covered chronologically, beginning with the earliest evidences, more than 10,000 years old, and ending with the historically documented tribes of the last few centuries. A final chapter pulls the information together; this chapter is followed by an extensive bibliography and a detailed index.

In the final chapter Wedel reemphasizes his main themes. First, to understand human history on the Plains, one must take the geographical background into account. Second, there were two major native economies in the area: that of the nomadic bison-hunters of the western Plains, whose well-known 19th-

century culture represented an intensification, made possible by the acquisition of the horse, of a way of life many centuries old and that of the horticultural village dwellers of the river valleys of the eastern Plains, who dominated the Plains from about A.D. 800 to 1750.

This is an excellent job, remarkably complete and up-to-date, considering the pace at which archeological studies on the Plains are moving today. On the debit side, the usefulness of the book as a reference and text would have been enhanced by more illustrations, by sub-heads within the chapters, and by the presentation of trait inventories in lists rather than in discursive paragraphs. Otherwise there are few faults to find. The writing is smooth, and the interpretations are cautious but not overly so. The book will doubtless see extensive use in courses on North American archeology, and it is appropriate as a reference volume for college and public libraries alike.

E. MOTT DAVIS

*Department of Anthropology,
University of Texas*

Northern Regions

Geology of the Arctic. vol. 1 and vol. 2. Gilbert O. Raasch, Ed. University of Toronto Press, Toronto, Canada, 1961. xv + 1196 pp. Illus. + maps. \$25.

The first international symposium on arctic geology, held in Calgary, Alberta, Canada, in January 1960, was a remarkable success, and the beautifully reproduced proceedings, entirely in English, are now available. The two volumes (86 papers and 16 abstracts) and a box of 34 black-and-white maps and charts present the work of 125 contributors, many of them leaders in their fields.

Section 1, Regional Geology, comprises volume 1 and consists of papers and abstracts grouped by the following areas: the Soviet arctic (4 papers, 63 pages, no references), Spitsbergen (2 papers, 76 pages, 157 references), Greenland (20 papers, 192 pages, 214 references), Canada (15 papers, 2 abstracts, 257 pages, 346 references), Alaska (1 paper, 4 abstracts, of which one is printed twice under two titles, 11 pages, 13 references), and the Arctic Ocean basin (8 papers, 3 ab-

stracts, 125 pages, 136 references). Probably for the first time, we now have available, in one volume, four excellent English-language summaries, with detailed correlation charts, of the tectonics and the Precambrian, Paleozoic, Mesozoic, and Cenozoic geology of the Soviet arctic.

The first paper on each geographic area outlines the tectonic history of the region and serves as an excellent introduction. The paper on the structural history of Spitsbergen is the longest in the volume. Papers on the geology of Greenland, with emphasis on northern and eastern Greenland, are admirably detailed and are marshalled mainly to cover the various geologic periods. Arctic Canada's stratigraphy is generalized by areas in four review papers, and the remaining 11 papers that are devoted to this area cover a variety of detailed topics, such as the gypsum tectonics and aeromagnetic studies. The only paper on Alaska deals with ostracods from the Gubik formation (Pleistocene). A fine series of papers on the Arctic Basin is introduced by Eardley's paper on theories of the origin of the basin.

One of the strongest reasons for holding a symposium to discuss polar geology is that many geological processes in polar areas either are unique or are modifications of those in the rest of the world. Section 2 (of volume 2) contains 21 papers and 8 abstracts which, with Craig and Fyle's paper in volume 1, are concerned with the fields of glaciology, climatology, glacial geology, permafrost, and geomorphology. There are ten review papers, most of which are excellent—for example, Legget's on permafrost, Thomas's on climatology, and Beschel's on lichenometry. Many of the ten original papers are good contributions, especially Smith's on ice-island morphology and Carey and Ahmad's on glacial marine sedimentation (however, this is based mostly on antarctic data).

Section 3, Logistics and Exploration (101 pages), contains several significant scientific contributions that seem out of place in a section having this title.

In summary, this expensive compilation contains a wealth of information and will provide a good reference work on arctic geology.

TROY L. PÉWÉ

*Department of Geology,
University of Alaska, and
U.S. Geological Survey*

Thallophyta

Lichen Handbook. A guide to the lichens of eastern North America. Mason E. Hale, Jr. Smithsonian Institution, Washington, D.C., 1961. x + 178 pp. Illus. + plates. \$4.

Although lichens are among the most numerous small plants in many areas (covering practically every tree and rock), they are the least known and least studied plants; this is probably due to the fact that a concise, accurate, popular treatment of the subject has not been available. Thus, the handbook makes a most needed contribution. Although it is intended as a semipopular introduction to lichenology, it should prove equally useful to the professional lichenologist and the amateur.

Broad but sufficiently detailed coverage is given to morphology and reproduction. Physiology is treated in somewhat more detail, and recent advances in the chemistry of lichens are covered rather thoroughly. The various lichen acids are described, and the species in which each is found are listed. The role of chemical tests in lichen identification and microchemical analyses is clearly and concisely discussed.

The most valuable part is the section devoted to collection and identification. This section contains clear, easy-to-follow (as lichens go), dichotomous keys to 30 genera and approximately 317 species of fruticose and foliose lichens known to occur in eastern North America. Also helpful is the fact that the geographical distribution, within the area, of each species is given. Owing to the difficulty of constructing a key for the crustose lichens, the approximately 100 taxa are keyed to genera only.

There are 58 figures which include many helpful drawings of lichen structure and of several species of *Cladonia*.

The 20 plates contain high quality close-up photographs of more than 90 species. There are several macrophotographs of such hard-to-illustrate key characteristics as insidia, soredia, cyphellae, pseudocyphellae, cephalodia, squamules, reticulately cracked cortex, and many others.

It is my feeling that, as a result of the publication of this long-needed and most excellent handbook, interest in the lichens will increase significantly within the next few years.

HASKELL C. PHILLIPS

*Department of Biology,
Austin Peay State College*