Book Reviews

Photosynthesis and Related Processes: Spectroscopy and Fluorescence of Photosynthetic Pigments; Kinetics of Photosynthesis, Vol. II, Part 1. Eugene I. Rabinowitch. New York: Interscience, 1951. 608 pp. $15.00.

The trend in books concerned with complex matters seems increasingly to be toward those written as a group effort by an assortment of specialists, under the generalship of an editor-in-chief who may or may not have a command of the subject as a whole. This trend, however, has not yet reached the field of photosynthesis. E. I. Rabinowitch is his own panel of experts surveying, as he does in *Photosynthesis and Related Processes,* the entire field, from history to descriptive biology to the quantum relations of the process—all with equal display of virtuosity.

The present volume, following its predecessor by six years, is concerned with the spectroscopy of the photosynthetic pigments and with the kinetics of the phytosynthetic process. So bulky did the materials on kinetics become that Volume II has been subdivided, more or less arbitrarily, into two parts. The present Part 1 of Volume II takes us only through the carbon dioxide and light intensity aspects of photosynthetic kinetics. Discussion of temperature, time effects, etc., will follow in Part 2.

As was the case with Volume I, a prodigious amount of information is presented—information that is critically evaluated and, in general, beautifully integrated into a lucid and well-defined picture. The reader is, in fact, continuously impressed by the ability of the author to carry through the evaluation and organization of scattered and miscellaneous information into a comprehensive and coherent picture.

Volume II deals first with the photochemistry of the chlorophylls, related porphyrins, and of the other plastid pigments. This is followed by a detailed discussion of the factors that influence light absorption by the chloroplast pigments, as well as the partition of energy among the several pigments in the cell itself. The physiological significance of pigment fluorescence is treated *in extenso.*

The study of the kinetics of photosynthesis is one of the classic approaches to the subject. Although this approach has, in the past, yielded much information of value, it cannot give us such detailed insight into the mechanism of photosynthesis as is obtainable from the studies of the pathways of energy and of carbon, as these pathways may now be studied with isolated chloroplasts or with isotopic carbon, respectively.

Concerning the 6 chapters on the kinetics of photosynthesis in the present volume the author says:

> The analysis of kinetic data, to which many pages in this volume are devoted, now seems somewhat like an attempt to reach a treasure chamber by drilling through steel walls while keys have been found to unlock the door.

Nonetheless, the reviews of carbon dioxide and of light effects in photosynthesis are not only the most comprehensive, but also the most readable, that have appeared to date. The discussions concern not only *Chlorella* in Warburg flasks but also higher plants under natural conditions, and will be of interest and value not only to workers in the field of photosynthesis, but also to ecologists and horticulturalists.

Some 56 pages of the volume are devoted to a discussion of the maximum quantum efficiency of photosynthesis. One finds no dogmatic conclusion but is left, nevertheless, with the rather definite impression that the maximum efficiency is 10 quanta used per mol of O_2 released.

Volume II, Part 1, of "Photosynthesis" is a thorough, readable, and often exciting member of a series that will be the standard reference work in the field for many years to come. It is wholeheartedly recommended to all biologists and chemists as excellent (but scarcely light) reading.

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Ecological Animal Geography (Hesse). 2nd ed. W. C. Allee and Karl P. Schmidt. New York: Wiley; London: Chapman & Hall, 1951. 715 pp. $9.50.

It was with Hesse's blessing that Allee and Schmidt, in the early thirties, undertook the translation and revision of his *Tiergeographie auf oekologischer Grundlage* (Jena: Fischer [1924]), and the resulting *Ecological Animal Geography* quickly became recognized after its publication in 1937 as the standard book on the subject.

The second edition of "Hesse, Allee, and Schmidt" follows the plan of the 1937 edition, practically chapter by chapter, with the greater part of the earlier subheads and illustrations also being retained. The text, however, shows a substantial amount of new material (an expansion by about 10%) and sufficient recasting of the old to cover the more recent progress in some modern ecological fields. Additions include treatment of territoriality in vertebrates, migration flyways of North American waterfowl, and the "phase theory" with regard to swarming locusts. Whether dealing with old or new subject matter, the revisers have worked to integrate our existing knowledge and to give the reader an interesting, understandable, and accurate over-all picture.

The present edition is comfortable to read, because of the way in which it is written and because of the confidence one feels in its authorship. Minor statements may be challenged—such as the puma hunting deer *only* at times of deep snow (p. 496) and monkeys *never* wandering farther than 4–6 km from water (p. 545)—but I don't think these detract importantly from the outstanding values of the book, which is indeed a scholarly and unique product.

The scope is patently designed to leave the reader with a balanced view concerning distribution, living requirements, and adaptations of animals over the world. Although it may be classed primarily as a textbook for college courses in ecology, *Ecological Animal Geography* always has been a good reference for mature biologists looking for basic information outside their specialties, and the second edition should thus be better still. Especially useful from the standpoint of easy orientation of ecological complexities are the reviews of faunal types characteristic of given habitats.

The book should instill in its readers a wholesome appreciation of life as a phenomenon, of the great push of organisms to occupy essentially every habitable place that they can reach, to live or try to live somehow from abyssal ocean depths to mountaintops, in caves, brine lakes, deserts, and other restricted niches to the lushest of prairies, marshlands, estuaries, and rain forests.

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Principles of Geology. James Gilluly, Aaron C. Waters, and A. O. Woodford. San Francisco: Freeman, 1951. 631 pp. $5.75.

Principles of Geology is one of the most stimulating books of its kind to appear in recent years, yet this reader finds it difficult to evaluate.

A nice balance of subject material is achieved although those following a more conventional approach will find an unorthodox lack of emphasis on geomorphological aspects. In general the organization and approach used by the authors seem well designed for their stated purpose of acquainting the reader with the *fundamentals* of geology. Their task is lightened by liberal use of simple analogies aimed to help the reader bridge the gap from the familiar to the new. Further, the numerous examples referred to in the text are excellent, and the technique of summation used following each chapter is to be commended. The book benefits also from a pleasing format, numerous excellent line drawings, and well-selected photographs.

There is, however, an unevenness in the quality of writing and organization that detracts from an otherwise exceptionally fine text. The style of writing is highly variable, sometimes reaching the extreme of an incomplete sentence (p. 323).

On the whole, this reviewer is in complete accord with the authors' principle of providing a background of allied fact for the geologic process under immediate discussion. Occasionally, however, the wealth of detail may obscure the immediate objectives.

The insertion of a chapter on ground water between those on glaciation and deserts (essentially wind erosion) seems to interrupt the development of the land surface erosion theme. The chapter on ground water might more suitably follow a discussion of deserts.

Again, definitions of textures of metamorphic rocks appear in Chapter 5, whereas the detailed description is treated in Appendix IV. It would have improved the organization of the chapter to have treated this group in entirely the same fashion as the igneous and sedimentary rocks. Furthermore, though Gilluly, Waters, and Woodford are meticulous in providing background material elsewhere in the text, by contrast they are quite parsimonious with the material presented in Appendix IV covering "Identification of Rocks."

The above are, at worst, minor criticisms. The book is stimulating, although on occasion ponderous; it is teachable, if my experiment in handing it to a complete novice is any guide; and it is nicely objective in its approach.

Some persons may question whether *Principles of Geology* is altogether suited to a group with no scientific background. (I rather think it would stimulate them to rise to its level.) There is no question but that it is to be recommended for the advanced undergraduate.

The authors and publishers are to be congratulated on a fine piece of work.

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Scientific Book Register

Where Winter Never Comes: A Study of Man and Nature in the Tropics. Marston Bates. New York: Scribners, 1952. 310 pp. $3.50.

The Genera of South African Flowering Plants. Botanical Survey of South Africa, Memoir No. 25, 1951. Rev. 2nd ed. E. Percy Phillips. Order through Government Printer, Pretoria, South Africa. 923 pp. £2.

Phosphorus Metabolism, Vol. I. A Symposium on the Role of Phosphorus in the Metabolism of Plants and Animals. Sponsored by the McCollum-Pratt Institute of The Johns Hopkins University. William D. McElroy and Bentley Glass, Eds. Baltimore: Johns Hopkins Press, 1951. 762 pp. $10.00.

Navaho Grammar. American Ethnological Society Pub., Vol. XXI. Gladys A. Reichard. Locust Valley, N. Y.: J. J. Augustin, 1952. 393 pp. $7.00.

Transmitting Valves: The Use of Pentodes, Tetrodes and Triodes in Transmitter Circuits. J. P. Heyboer and P. Zijlstra. Eindhoven: Philips' Technical Library, 1951. U. S. distrib.: Elsevier Press, Houston. 308 pp. $6.25.

Handbook of Dangerous Materials. N. Irving Sax, with assistance of M. J. O'Herin and W. W. Schultz. New York: Reinhold, 1951. 848 pp. $15.00.

Cancer Cytology of the Uterus: Introducing a Concept of Cervical Cell Pathology. J. Ernest Ayre. New York: Grune & Stratton, 1951. 407 pp. and 362 figs. $14.50.

Manufacturing Processes. 3rd ed. Myron L. Begeman. New York: Wiley; London: Chapman & Hall, 1952. 608 pp. $6.00.

Quantum Theory of Matter. John C. Slater. New York–London: McGraw-Hill, 1951. 528 pp. $7.50.

Synthetic Resins and Allied Plastics. 3rd ed. R. S. Morrell and H. M. Langton, Eds. New York: Oxford Univ. Press, 1951. 747 pp. $10.00.

Television Engineering. 2nd ed. Donald G. Fink. New York–London: McGraw-Hill, 1952. 721 pp. $8.50.