

Analytic Function Theory. vol. 1. Einar Hille. Ginn, Boston, Mass., 1960. xi + 308 pp. \$6.50.

Americans are fortunate that a translation of Caratheodory's great *Theory of Functions* (Chelsea, 1954), which stresses the geometric aspects of function theory, has been followed so soon by an equally fine work in English, which stresses the analytic aspects of function theory. The first volume of Hille's treatise, here under review, is the best introduction to the classical theory which has yet appeared in our language. The book is well-planned, well-organized, and beautifully written. It will surely become a modern classic.

The prerequisite for reading this book is a good course in advanced calculus, which means that it could be used as a text in most American colleges for either senior students or first-year graduate students of mathematics. However, the book is much more than just another text. Hille, in addition, sets his subject in the broader framework of modern, functional analysis and topology. He also presents his subject as a living, evolving structure to which many minds have contributed. The interesting historical remarks and biographical details about the great mathematicians who have developed function theory give the book depth and spaciousness. They should also serve to help the aspiring young mathematician to

Give past exemplars present room
And their experience count as mine.

The mature mathematician will find the book excellent reading even when it deals with the most familiar subject matter. There is a continual succession of small novelties of proof and presentation. The style is concise but extremely lucid, and trivial details are not laboriously spelled out. However, I would like to see some mention of Menchoff's theorem in the chapter on holomorphic functions and a development somewhere of the Euler-MacLaurin sum formula. Without this, the deduction of Stirling's formula in chapter 8 seems a little heavy.

The plan of the book is sufficiently indicated by the chapter titles: Chapter 1, "Number systems"; Chapter 2, "The complex plane"; Chapter 3, "Fractions, powers, and roots"; Chapter 4, "Holomorphic functions"; Chapter 5, "Power series"; Chapter 6, "Some elementary functions"; Chapter 7,

"Complex integration"; Chapter 8, "The calculus of residues"; Chapter 9, "Representation theorems."

There is a good selection of problems and of suggested collateral reading. The three appendixes on point set theory, properties of polygons, and the theory of integration make the book practically self-contained, and they enhance its value for self-study.

After such a fine beginning the mathematical world will look forward with interest to the projected second volume of Hille's treatise.

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Handbuch der Pflanzenanatomie. vol. 3, part 4, *The Plant Cell-Wall*. P. A. Roelofsen. Translated from the Dutch manuscript with the assistance of C. E. B. Bremekamp. Borntraeger, Berlin, 1959. vii + 336 pp.

The literature dealing with the chemical composition, physical properties, and microscopic structure of plant cell-walls, which has accumulated during a period of more than 100 years, is so voluminous that it is impossible to cover it in a single book. In this second edition, Roelofsen aims to give a critical exposition of the present state of knowledge with emphasis upon progress since the publication of the first edition (1925).

One cannot adequately evaluate the merits and significance of a book of such diversified subject matter in a review restricted to less than 500 words. In general, the book gives a critical and unbiased discussion of the limitations as well as the significance of techniques and of the reliability of generalizations that have been formulated by their use. It reveals how much still remains to be learned regarding diversified types of cell-walls. Thus, it provides a valuable reference book for chemists, physicists, and botanists who desire a résumé of available knowledge which provides clues regarding problems in need of future investigation and solution.

It should be noted in this connection, however, that there are rather conspicuous inequalities of treatment. In other words, there are parts of the text where the discussion is excessively brief and, at least in some of them, inaccurate or misleading.

For example, in dealing with the primary wall of growing cells, the orientation of cellulosic microfibrils in the lateral meristem or cambium is discussed. Unfortunately, the term *cambium* frequently has been expanded to include a relatively wide zone of soft tissue which includes not only the initials of the lateral meristem but also differentiating elements of the xylem and phloem. Therefore, in electron photographs obtained from disintegrated cells of the so-called cambial zone, there are no means of determining with certainty whether fragments were obtained from cambial initials or from their daughter cells in early stages of tissue differentiation.

In the case of the secondary wall, in contrast to the primary one, electron microscopy thus far has contributed little more than verification of conclusions reached during the 1930's by synthesis and harmonization of evidence obtained by "ordinary" microscopic techniques, polarization microscopy, and x-ray analyses. The literature of this significant transitional period certainly merits more adequate consideration.

There is a curious misinterpretation of my own work. Illustrations of the cross-section of a *Pandanus* fiber and of the phenomenon of "ballooning" in such a cell are reproduced with implication of an erroneous conclusion. A careful reading of our original paper and of a subsequent one which has diagrams illustrating changes in fibrillar orientation demonstrate that our interpretation of ballooning was correct.

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Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas. William Randolph Taylor. University of Michigan Press, Ann Arbor, 1960. xi + 870 pp. Illus. \$19.50.

The appearance of this long-awaited work is an event of great importance. Until now, the marine algae of the vast western Atlantic warm-water shores of the Americas, from North Carolina to Uruguay, could be identified only by referring to a large number of scattered publications. Recent recognition of the role of marine resources in the Latin American economy

has underscored the need for a comprehensive descriptive list of seaweeds. Taylor has filled this need in a superior manner. His field and herbarium experience of more than 30 years, his skill in bookmaking, his ability to see the forest despite the trees—these qualifications are manifest throughout the book.

The descriptive catalog, which comprises most of the book, treats 760 species. Diagnoses are given for all taxa of the rank of order and below, while keys are provided for families, genera, and species. There are 80 plates of line drawings and photographs. The bibliography is exhaustive.

Taylor offers, in addition to the descriptive catalog, a historical survey, directions for collecting and preserving specimens, and a particularly informative discussion of the geographic and ecological distribution of seaweeds, illustrated by excellent photographs.

A reviewer of a taxonomic work need not look hard to find points of disagreement, but these differences of opinion do not necessarily detract from the utility of the work. It is disappointing, however, to encounter various new nomenclatural and taxonomic decisions for which no supporting arguments are given.

The jacket refers to this work as a manual, but it is even less a manual than it is a definitive floristic monograph. Actually, it is an elaborate study outline: a carefully compiled check list based on literature and herbarium records, augmented by field study in selected areas. Phycologists should be grateful for this foundation for future study and should not be too dissatisfied with the unevenness of treatment, both geographic and taxonomic, or with the large number of loose ends, which Taylor wisely chose to spotlight rather than to conceal.

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Under the Deep Oceans. Twentieth century voyages of discovery. T. F. Gaskell. Norton, New York, 1960. 240 pp. Illus. \$3.95.

Many people who work on the oceans seem at some time to keep a personal log or journal. Gaskell's book *Under the Deep Oceans* will be particularly interesting to those who have tried to write down their experiences in quiet seas or strange ports. Anec-

dote and humorous comment on things done and places visited by the *Challenger* Expedition of 1950 are the media holding Gaskell's account together. The author's style resembles "sea-story" sessions often held on the fantail of ships.

The scientific text is a straightforward, much-condensed discussion of many aspects of marine science, with emphasis on the part played by the *Challenger* cruise in collecting data. The author takes every opportunity to point out the usefulness of marine science to society, particularly to the oil industry and the Royal Navy. Gaskell points to the similarity of interest between marine scientists and the oil industry in developing instruments—such as seismic apparatus—and in developing various drilling techniques, and he urges the oil industry to give additional support to deep-ocean research.

Readers will find this book entertaining; the author does not waste a good story because he happens to be involved in discussions of seismic records or the difficulties of fixing position at sea. Even while readers ponder the punishment for adultery at Nukufetau, it is apparent that the author has led them through a rather wide variety of basic problems associated with the seas.

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New Books

General

Sax, Karl. *Standing Room Only*. The world's exploding population. Beacon Press, Boston, ed. 2, 1960. 206 pp. Paper, \$1.75.

Schapero, Max, et al. *Dictionary of Visual Science*. Chilton, Philadelphia, Pa., 1960. 799 pp. \$15. Contains over 13,000 listings; a total of 61 collaborators and contributors are listed. Examples of contents: "A case. See case, type A." "macula (mak'ulah). Any uniquely pigmented area such as the macula lutea of the retina. 2. A corneal macula."

Mathematics, Physical Sciences, and Engineering

Brinkmann, Roland. *Geologic Evolution of Europe*. Translated by J. E. Sanders. Enke, Stuttgart; Hafner, New York, 1960. 161 pp. \$8.50. A condensed version of the second volume of ed. 8 of *Abriss der Geologie*. Only those parts which refer to the geology of Europe were translated.

Coulson, Kinsell L., Jitendra V. Dave, and Zdenek Sekera. *Tables Related to Radiation Emerging from a Planetary Atmosphere with Rayleigh Scattering*. Univ. of California Press, Berkeley, 1960. 560 pp. \$12.50.

Dunsheath, Percy. *Electricity*. How it works. Crowell, New York, 1960. \$3.95.

Hohn, Franz E. *Applied Boolean Algebra*. An elementary introduction. Macmillan, New York, 1960. Paper, \$2.50.

Hoyle, Fred. *The Nature of the Universe*. Harper, New York, rev. ed., 1960. 141 pp. \$3.

Judkins, Henry F., and Harry A. Keener. *Milk Production and Processing*. Wiley, New York, 1960. 460 pp. \$7.95.

Kleinberg, Jacob, William J. Argeringer, Jr., and Ernest Griswold. *Inorganic Chemistry*. Heath, Boston, 1960. 688 pp. \$10.75.

Leet, L. Don. *Vibrations from Blasting Rock*. Harvard Univ. Press, Cambridge, Mass., 1960. 134 pp. \$4.75.

Mach, Ernst. *The Science of Mechanics*. A critical and historical account of its development. Translated by Thomas J. McCormack. Open Court Publishing Co., LaSalle, Ill., ed. 6 (with revisions through ed. 9), 1960. 665 pp. \$6.

Marton, L., Ed. *Advances in Electronic and Electron Physics*. vol. 12, *Photo-Electronic Image Devices*. J. D. McGee and W. L. Wilcock, Eds. Academic Press, New York, 1960. 409 pp. \$12. This volume is the proceedings of a symposium convened in London by McGee during 1958.

Rabi, I. I. *My Life and Times as a Physicist*. Claremont College, Claremont, Calif., 1960. 61 pp.

Renfrew, A., and Phillip Morgan, Eds. *Polythene*. The technology and uses of ethylene polymers. Iliffe, London; Interscience, New York, ed. 2, 1960. 802 pp. \$25.75.

Richards, James A., Francis W. Sears, M. Russell Wehr, and Mark W. Zemansky. *Modern University Physics*. Addison-Wesley, Reading, Mass., 1960. 1022 pp. \$10.75.

Roberts, J. K. *Heat and Thermodynamics*. Interscience, New York, ed. 5, 1960. \$7.25. This fifth edition was revised by A. R. Miller.

Slater, John C. *Quantum Theory of Atomic Structure*. vol. 1. McGraw-Hill, New York, 1960. 514 pp. \$11.

Soviet Research in Geophysics. vol. 1, *A Collection of Articles on Dynamic Meteorology*, I. A. Kibel, Ed., 181 pp., \$8; vol. 2, *Isostasy and Isostatic Hypotheses*, E. N. Lyustikh, 119 pp., \$6.50; vol. 3, *The Microstructure and Macrostructure of Elastic Waves* (in one-dimensional continuous nonhomogeneous media), B. N. Ivakin, 113 pp., \$6. American Geophysical Union and Consultants Bureau, New York, 1960. These volumes, the first in a new series, are translations of *Trudy* Nos. 37–39 of the Geophysical Institute of the Academy of Sciences of the U.S.S.R.

The Space Encyclopaedia. A guide to astronomy and space research. Dutton, New York, ed. 2, 1960. 288 pp.

Wilkinson, W. D., Ed. *Extractive and Physical Metallurgy of Plutonium and Its Alloys*. Interscience, New York, 1960. 324 pp. \$10.50. Based on a symposium held in February 1959. The volume includes a 45-page annotated bibliography prepared by the editor.

Zeldovich, Ia. B., and A. S. Kompaneets. *Theory of Detonation*. Academic Press, New York, 1960. 284 pp. \$10. Translated from the original Russian edition (1955).