ters on community factors and resources in the education of the gifted and on the gifted child in the family.

As has already been implied, the consideration is of youngsters in the elementary and secondary schools rather than students in college, although integration of the work of secondary school and college is touched on. There is much illustrative material, there are appendixes listing tests useful in locating superior children and organizations interested in them, and there is a classified annotated bibliography.

To me it seems unfortunate that there is no mention of Lehman's monumental work on age of achievement and of his finding that best creative work tends to be done early in the young adult years. In view of the increasingly long preparation now required in scientific and other fields, that finding adds urgency to efforts to facilitate the progress of able young people into careers. But, in total, the volume is exceptionally broad in treatment, in the sources on which it draws, and in the variety and practical nature of the suggestions of ways in which schools may find and foster the talents of the gifted.

S. L. PRESSEY

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Plant Virus Serology. R. E. F. Matthews. Cambridge University Press, New York, 1957. xi + 128 pp. Illus. $5.

This excellent little volume is a manual of laboratory methods in plant virology. Aside from the condensed account in Bawden's general textbook, it seems in fact to be the only existing description of plant virus serology.

There are 11 chapters: "Introduction," "Types of serological test," "Routine testing for virus infection," "Serological tests for determining relationships among plant viruses," "The precipitin reaction," "The antibody content of sera," "Methods of estimating virus concentration," "The cross absorption procedure," "Precipitation in mixed systems," and "The applicability of serological techniques." The first chapter is a general introduction and assumes no knowledge of serology on the part of the reader. The nature of subsequent chapters is well indicated by their titles. To avoid any possible misunderstanding, however, it may be remarked that the antibodies used are animal (rabbit) antibodies.

In addition to the quantitative nitrogen methods introduced into serology by Heidelberger and Kendall, the author makes much use of quantitative timing of the precipitin reaction, including the optimal proportions method introduced by Dean and Webb and modifications of this method suggested by Hooker and Boyd, and by Boyd, little used in this country. The author's interpretation of the beta optimum is somewhat different from that of the latter authors but not necessarily incorrect. These relatively little known methods, plus a serological chromatographic method attributable to Matthews, are evidently of great value, especially for estimating small amounts of virus.

The book is well illustrated by six plates and 12 text figures. There are a bibliography of more than 100 titles, a subject index, and an author index.

WILLIAM C. BOYD

Boston University

Development of Vertebrates. Emil Witschi. Saunders, Philadelphia, Pa., 1956. xvi + 588 pp. Illus. $8.50.

This textbook of embryology is based on a new and original plan, incorporating a considerable amount of material on experimental embryology, developmental physiology (especially metabolism), and the endocrinology of reproduction. Such a plan results in a far more complete and well-rounded elucidation of developmental processes than was possible in the older textbooks based on a strictly morphological approach. The author's research experience in the fields of experimental embryology and endocrinology has, of course, eminently qualified him to prepare this new type of presentation. The clarity of the writing and the excellence of the illustrations make the book a pleasure to read, and these features will be appreciated by the college students who will use it. Since students majoring in zoology or in premedical work (for whom the book is intended) may eventually enter fields of biological or medical research, rather than medical practice, this approach provides a valuable stimulus to the coming generation of research workers in the biological sciences.

A great deal of material is covered in the 588 pages; basic concepts are outlined (10 pages), and there are general sections on maturation of the gametes (33 pages), fertilization (11 pages), and cleavage and gastrulation (13 pages) as well as longer and more specialized sections on the development of fishes (24 pages), amphibians (118 pages), birds (146 pages), and mammals, including man (179 pages). Experimental material is incorporated in the sections on each form, and there are separate chapters dealing with the developmental physiology of each group. The conclusions, which are based on the experimental work, are well documented. There is an adequate bibliography (12 pages) of the more important recent and older references.

The relative emphasis on the various topics (indicated, in part, by the amount of space devoted to each) has been carefully considered and, in my opinion, correctly placed. In addition, the book has been kept sufficiently concise for use in a one-semester course by a rigid systematizing of the descriptive materials contained in the representative life-histories. As the author states in the introduction (page vi), the book aims to contribute toward "a realization, by the student, that development is a natural process which is open to scientific analysis by research methods not essentially different from those of the inorganic sciences."

The excellent, well-labeled illustrations utilize a variety of techniques, from photographs to line drawings, and are beautifully reproduced. Many of these figures have not been published before.

In short, the book is a usable and useful addition to the available textbooks of modern embryology.

D. P. COSTELLO

University of North Carolina

The Genus Achlya: Morphology and Taxonomy. University of Michigan studies, scientific series. vol. XX. Terry W. Johnson, Jr. University of Michigan Press, Ann Arbor; Cumberlege, Oxford University Press, London, 1956. 180 pp. Illus. $4.50.

This short monograph deals with the largest genus of a family of aquatic Phycomycetes, the Saprolegniaceae, or "water molds." Taxonomically the entire family is a difficult one—extreme variability of vegetative and asexual structures leaves only the slightly less variable sexual organs and features as taxonomic criteria—in which the largest component genus certainly contains its full share of puzzling relationships and uncertainties. The author is clearly aware of these difficulties and limitations, uncomplainingly accepts them as completely unavoidable, and proceeds about the treatment of the group with admirable firmness and discrimination and with an equally admirable lack of pomposity: on page 74 he actually reduces *Achlya michiganensis* Johnson to synonomy. A great deal of effort obviously went into securing collections from widely scattered sources, particularly cultures or preserved samples, or both, of original materials from previous authors in the group; these materials, together with Terry Johnson's own numerous collections, constitute an extensive basis

for critical comparative evaluation. The keys are constructed on minimal discriminating criteria, and the many figures—simple line drawings—serve well to illustrate the inconspicuous but pertinent points of specific discrimination. The descriptions have been reworked, in many cases, from firsthand study of living material or from thorough reexamination of preserved original materials.

Commendable as this approach is in general—and in practically every case in particular—it led to one item of error that happens to lie within my spotting competence: the keyed distinction between the two heterothallic species of the genus, *A. bisexualis* and *A. ambisexualis*, is that the oospores (zygotes) of the former usually abort. This is a libel on a once perfectly virile fungus that has grown increasingly impotent under enforced and prolonged domestication, and precisely the same manifestations of senility now appear in the strains of *both* species that are currently available from the two culture collections in which they were deposited about 1951! In extenuation, however, it is a rare mycologist indeed who has not at one time or another been embarrassed by the sexual inconstancy of fungi in continued culture.

In addition to the taxonomic treatment of the genus *Achlya*, there is an all-too-summary introduction, comprising sections devoted to the history of the understanding of the biology of the group, the occurrence and distribution of its members in nature, and the methods of their collection, isolation, and culture. This introductory material could apply equally well to the entire group of water molds, and it is here that one could wish that the author had written with less restraint. The taxonomic problems here represent only one facet of a very interesting group of plants, and the book would have had far wider appeal had there been a broader treatment of the group.

To anyone who happens to have an unknown *Achlya* on his hands, the book will prove invaluable; it is not likely, unfortunately, to send anyone scurrying to the nearest pond in search of unknown *Achlyas* or to stimulate any appreciable new interest in an unusual group of plants that deserves greater recognition among biologists generally.

JOHN R. RAPER
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Books Reviewed in The Scientific Monthly, October

Rockets, Missiles and Space Travel, W. Ley (Viking). Reviewed by T. S. Gardner.

Medical Department, United States Army, Surgery in World War II, vol. II, *General Surgery*, Office of the Surgeon General, Department of the Army. Reviewed by M. C. Leikind.

Quest for a Continent, W. Sullivan (McGraw-Hill). Reviewed by H. G. R. King.

Operation Deepfreeze, G. J. Dufek (Harcourt, Brace). Reviewed by H. G. R. King.

Natural History of Birds, L. W. Wing (Ronald). Reviewed by H. G. Deignan.

Family Medical Costs and Voluntary Health Insurance: a Nationwide Survey, O. W. Anderson with J. J. Feldman (Blakiston Div., McGraw-Hill). Reviewed by R. V. Lee.

1001 Questions Answered about the Seashore, N. J. Berrill and J. Berrill (Dodd, Mead). Reviewed by D. P. Abbott.

Nuclear Weapons and Foreign Policy, H. A. Kissinger (Harper). Reviewed by B. Brodie.

Archaeology in the U.S.S.R., M. Miller (Praeger). Reviewed by M. Gimbuta.

Light, Vegetation and Chlorophyll, J. Terrien, G. Truffaut, J. Carles; translated by M. E. Thompson (Philosophical Library). Reviewed by J. Bonner.

The Fight for Fluoridation, D. R. McNeil (Oxford Univ. Press). Reviewed by A. P. Black.

Follow the Whale, I. T. Sanderson (Little, Brown). Reviewed by W. E. Schevill.

The Language of Modern Physics, E. H. Hutten (Allen & Unwin; Macmillan). Reviewed by P. Suppes.

A History of Mechanics, R. Dugas; translated by J. R. Maddox (Griffon; Central Book). Reviewed by D. J. Price.

About Earthquakes, G. A. Eiby (Harper). Reviewed by B. Gutenberg.

The Amateur Astronomer, P. Moore (Norton). Reviewed by J. W. Chamberlain.

A Key to the Stars, R. van der Riet Woolley (Philosophical Library). Reviewed by J. W. Chamberlain.

New Books

Metallurgical Progress—3. A third series of critical reviews (reprinted from *Iron & Steel*). Iliffe, London; Philosophical Library, New York, 1957. 88 pp. $6.

Movement of the Heart and Blood in Animals. An anatomical essay. William Harvey. Translated from the original Latin by Kenneth J. Franklin and published for The Royal College of Physicians of London. Thomas, Springfield, Ill., 1957. 209 pp. $3.50.

Natürliche und Künstliche Erbänderungen. Probleme der Mutationsforschung. Hans Marquardt. Rowohlt, Hamburg, 1957. 177 pp.

Rogers' Inorganic Pharmaceutical Chemistry. Taito O. Soine and Charles O. Wilson. Lea & Febiger, Philadelphia, ed. 6, 1957. 705 pp. $9.50.

Polyethylene. Theodore O. J. Kresser. Reinhold, New York; Chapman & Hall, London, 1957. 217 pp. $4.95.

Radiation Shielding. B. T. Price, C. C. Horton, K. T. Spinney. Pergamon Press, London, 1957. 359 pp. $10.

Swine Feeding and Nutrition. Tony J. Cunha. Interscience, New York, 1957. 296 pp. $5.

A Textbook of Dairy Chemistry. vol. I, *Theoretical;* vol. II, *Practical*. Edgar R. Ling. Philosophical Library, New York, ed. 3, 1957. 227 pp.; 140 pp. $12 per set.

Vanguard! The story of the first man-made satellite. Martin Caidin. Dutton, New York, 1957. 288 pp. $3.95.

Zinsser Bacteriology. David T. Smith, Norman F. Conant and others, Eds. Appleton-Century-Crofts, New York, ed. 11 of *Textbook of Bacteriology* by Hiss and Zinsser, 1957. 966 pp.

Advances in Catalysis and Related Subjects. vol. IX, *Proceedings of the International Congress on Catalysis*. Philadelphia, 1956. Adalbert Farkas, Ed. Academic Press, New York, 1957. 865 pp. $16.

Animals Parasitic in Man. Geoffrey Lapage. Penguin Books, Baltimore 11, 1957. 320 pp. Paper, $0.95.

The Atlantic. A history of an ocean. Leonard Outhwaite. Coward-McCann, New York, 1957. 479 pp. $6.50.

Constructing an Astronomical Telescope. G. Matthewson. Philosophical Library, New York, ed. 2, 1957. 100 pp. $3.

A Dictionary of Scientific Terms. Pronunciation, derivation, and definition of terms in biology, botany, zoology, anatomy, cytology, genetics, embryology, physiology. I. F. Henderson and W. D. Henderson; ed. 6 by J. H. Kenneth. Van Nostrand, Princeton, N.J., ed. 6, 1957. 548 pp. $12.50.

The Direction of Research Establishments. Proceedings of a symposium held at the National Physical Laboratory 26–28 September 1956. National Physical Laboratory. Her Majesty's Stationery Office, London, 1957 (order from British Information Service, New York). 4 sections.

Drugs and the Mind. Robert S. de Ropp. St. Martin's, New York, 1957. 320 pp. $4.50.

Functional Neuro-Anatomy. Including an atlas of the brain stem. A. R. Buchanan. Lea & Febiger, Philadelphia, ed. 3, 1957. 362 pp. $7.50.

The Hebrew Iliad. The history of the rise of Israel under Saul and David. Written during the reign of Solomon probably by the priest Ahimaaz. Translated from the original Hebrew by Robert H. Pfeiffer; general and chapter introductions by William G. Pollard. Harper, New York, 1957. 154 pp. $2.50.

History of Entomology in World War II. Publication 4294. Emory C. Cushing. Smithsonian Institution, Washington, 1957. 123 pp.

An Introduction to Reactor Physics. D. J. Littler and J. F. Raffle. Published for the United Kingdom Atomic Energy Authority. McGraw-Hill, New York; Pergamon, London, ed. 2, 1957. 218 pp.

Magnetohydrodynamics. A symposium. Rolf K. M. Landshoff, Ed. Stanford University Press, Stanford, Calif., 1957. 125 pp. $4.