

time, beg to be given pencils or crayons, and lose interest in a pencil with a broken point or a dried up brush.

The most striking artistic productions are the multistage colored paintings achieved by giving Congo one brush after another, each loaded with a particular color of paint. This technique made possible the entrancing colored pictures, some with radiating fan patterns and bold circular loops, illustrated in the remarkable color plates.

HARRY F. HARLOW

Primate Laboratory,
Department of Psychology,
University of Wisconsin

Measuring Through Space

Astronomical Spectroscopy. A. D. Thackery. Macmillan, New York, 1961. xvi + 256 pp. Illus. \$3.95.

Stars are so remote that not one of them shows the least discernible dimension. Nevertheless, astrophysicists have managed to deduce a remarkable number of details about the physical processes that go on in their outer layers. The clues lie in the spectra of the stars, and here, in the spectra, is the key to nearly all of what we can hope to learn about the nature of cosmic sources of radiation and about the absorbing interstellar medium as well.

The store of information in astronomical spectra seems almost to defy exhaustion: the chemical compositions of stars and nebulae; their temperatures, masses, dimensions, and luminosities; stellar distances and velocities of approach and recession; and such details as stellar atmospheric pressures, densities, magnetic fields, atmospheric motions, and the rate of escape of stellar matter into space.

Thackery describes ways that astrophysicists make the spectra of stars and nebulae give answers. The book is intended for those who have little background in this area of astronomy. Although the discussion is largely qualitative, it is by no means shallow. An early chapter presents some fundamentals of atomic and molecular transitions. The remainder of the book puts these to work in the interpretation of a large and representative variety of sources that range over the sun and planets, normal and unstable stars, nebulae, the interstellar medium, and the galaxies. The chapter on ionization in a stellar atmosphere is particularly

well done. Thackery places his emphasis nicely on current problems of astronomical spectroscopy and he raises a wealth of unanswered questions. The final chapter, on questions concerning the evolution of the stars, is a natural culmination.

The book is extensively illustrated with line drawings. However, the peculiarities of astronomical spectra can be conveyed only by reproducing photographic spectrograms. Unfortunately, few of these are used here (only those in the frontispiece). A spectrogram with molecular bands would have contributed to the discussion of molecular spectra and to the discussion of the spectra of the planets and cool stars. A drawing of the radio astronomer's 21-centimeter profile would have added to the discussion of hydrogen in the spiral arms. But these are minor defects. There has been a long-standing need for a book like this. The author's sure hand and friendly style should assure it a warm welcome among undergraduates and serious amateurs.

BENJAMIN F. PEERY, JR.

Astronomy Department,
Indiana University

New Books

Biological and Medical Sciences

Advances in Veterinary Science. vol. 7. C. A. Brandly and E. L. Jungherr, Eds. Academic Press, New York, 1962. 414 pp. Illus. \$14.

Australian Conference on Radiobiology. *Proceedings of the Third Conference.* Held at the University of Sidney, 15-18 August 1960. P. L. T. Ilbery, Ed. Butterworth, Washington, D.C., 1961. 324 pp. Illus. \$11.

Biology. Claude A. Villee. Saunders, Philadelphia, ed. 4, 1962. 646 pp. Illus. \$7.50.

Carbohydrate Resources within the Perennial Plant. Their utilization and conservation. C. A. Priestly. Commonwealth Agricultural Bureaux, Farnham Royal, England, 1962. 126 pp. 15s.

Cerebral Sphingolipidoses. Stanley M. Aronson and Bruno W. Volk, Eds. Academic Press, New York, 1962. 473 pp. Illus. Plates. \$18. Papers (30) from the symposium on Tay-Sachs' disease and allied disorders held at the Isaac Albert Research Institute and the Downstate Medical Center of the State University of New York in March 1961.

Evolution and Genetics. David J. Merrell, Holt, Rinehart, and Winston, New York, 1962. 437 pp. Illus. \$6.

Fortschritte der Zoologie. vol. 14. Max Hartmann. Fischer, Stuttgart, Germany, 1962. 556 pp. Illus. DM. 98.

General Biology. William C. Beaver. Mosby, St. Louis, Mo., ed. 6, 1962. 765 pp. Illus. \$8.

Genetic Polymorphisms and Geographic Variations in Disease. Baruch S. Blumberg, Ed. Grune and Stratton, New York, 1961. 244 pp. Illus. Proceedings (9 papers) of the conference held at the National Institutes of Health, Bethesda, Md., in February 1960.

Laboratory Manual of Microbiology for Preprofessional Students in the Medical Sciences. George L. Peltier and Keith H. Lewis. Macmillan, New York, ed. 3, 1962. 176 pp. Illus. Paper, \$3.50.

Muscles Alive. Their functions revealed by electromyography. J. V. Basmajian. Williams and Wilkins, Baltimore, Md., 1962. 278 pp. Illus. \$8.50.

Mutation. An introduction to research on mutagenesis. pt. 1, *Methods.* Charlotte Auerbach. Oliver and Boyd, London, 1962. 188 pp. Illus. Plates. 12s. 6d.

Neuropsychopharmakologie. Symposium der Deutschen Arbeitsgemeinschaft für Neuropsychopharmakologie. Karger, Basel, Switzerland, 1962. 285 pp. Paper.

New Methods of Cell Physiology. Applied to cancer, photosynthesis, and mechanism of x-ray action. Otto Heinrich Warburg. Interscience, New York, 1962. 659 pp. Illus. \$35.

On the Morphology and Classification of the Brachiopod Suborder Chonetoides. Helen M. Muir-Wood. British Museum (Natural History), London, 1962. 140 pp. Illus. Plates. £5 10s.

The Ovary. vol. 2. Solly Zuckerman, Ed. Academic Press, New York, 1962. 613 pp. Illus. Plates. \$22.

Pesticide Handbook. Donald E. H. Frear, Ed. College Science Publishers, State College, Pa., ed. 14, 1962. 305 pp. Paper, \$2.50; cloth, \$3.50.

Plant Taxonomy. Methods and principles. Lyman Benson. Ronald, New York, 1962. 503 pp. Illus. \$11.50.

Progress in Comparative Endocrinology. suppl. 1, *General and Comparative Endocrinology.* Kiyohsi Takewaki, Ed. Academic Press, New York, 1962. 398 pp. Illus. Paper, \$14; cloth, \$16. Proceedings (35 papers and discussion, in English) of the Third International Symposium on Comparative Endocrinology, held in June 1961 at Oiso, Japan.

Rabbit Brain Research. vol. 1, *Atlas for Stereotaxic Brain Research on the Conscious Rabbit.* Marcel Monnier and H. Gangloff. Elsevier, New York, 1961. 83 pp. Illus. \$13.

Recent Advances in Anatomy. F. Goldby and R. J. Harrison, Eds. Little, Brown, Boston, 1962. 486 pp. Illus. \$12.50.

Soil Animals. D. Keith McE. Kevan. Philosophical Library, New York, 1962. 282 pp. Illus. + plates. \$10.

Ultrastructure in Biological Systems. vol. 1, *Tumors Induced by Viruses: Ultrastructural Studies.* Albert J. Dalton and Françoise Haguénau, Eds. Academic Press, New York, 1962. 240 pp. Illus. \$9.50.

Die Vegetation der Erde in ökologischer Betrachtung. vol. 1, *Die tropischen und subtropischen Zonen.* Heinrich Walter. Fischer, Jena, East Germany, 1962. 551 pp. Illus. DM. 68.10.

La Vie. Jean Rostand and Andree Tetry. Larousse, Paris, 1962. 466 pp. Illus. Plates.

Your Biology. Ella Thea Smith and Lorenzo Lisonbee. Harcourt, Brace and World, New York, ed. 2, 1962. 472 pp. Illus. Plates.