

vised edition. The not infrequent wide separation of text reference and color plate could be avoided by a page reference to assist the reader.

There is a brief glossary, a bibliography, and an index. The author, the photographers, and the publisher are to be congratulated for producing a work that is well worth its purchase price.

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Radiation Damage in Solids. Douglas S. Billington and James H. Crawford, Jr. Princeton University Press, Princeton, N.J., 1961. xi + 450 pp. Illus. \$12.50.

In recent years it has become increasingly apparent that many of the most useful and striking properties of solids depend directly or indirectly upon the presence of imperfections in the crystalline lattice, that is, upon the defect structure of the solid. Dramatic changes may occur in the physical properties of materials subjected to energetic irradiation, because of the production of defects. Unfortunately for nuclear technology, such effects are particularly pronounced in fissile materials. In other engineering applications, as well, new and stringent requirements on defect structure have arisen for solids for use as structural materials at very high or very low temperatures or for use as complex electronic circuit components. The availability of very intense sources of energetic radiation which facilitate controlled investigation of the crystalline defects thereby produced has therefore encouraged the study of these crystal defects for their own sake.

Billington and Crawford, long associated with fundamental studies, primarily in neutron damage, at Oak Ridge National Laboratory, have set down a comprehensive yet compact account of the whole field of radiation effects studied by physicists and metallurgists. Included in this volume are accounts of the effects in metals, alloys, minerals and glasses, ionic crystals, semiconductors, and even in those particularly perverse substances uranium and graphite. Reference is made to the work, through 1959, of nearly 600 scientists.

Many useful criticisms and evaluations of the work discussed are incorpo-

rated. The authors have not hesitated to include impartial accounts of conflicting studies in which final judgments cannot yet be reached, but occasionally they have not been ruthless enough to leave out some work which is muddled or which defies comparison with other investigations.

The treatment is well adapted to the needs of one who is considering, doing, or interpreting experimental work on radiation damage or lattice imperfections. Three introductory chapters present the essential results of existing calculations of the inelastic interactions of radiation with solids as well as of important secondary effects, an outline of the influence of lattice imperfections on the properties of solids, and a critical and practical discussion of radiation sources suitable for damage studies.

As might be expected in a growing field, progress in obtaining unambiguous experimental results and in understanding them has been startlingly precise in some cases and depressingly incomplete in others. Understanding of a broad range of effects has now been reached in a qualitative and phenomenological manner.

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New Books

Biological and Medical Sciences

The Actinomycetes. vol. 2, *Classification, Identification and Descriptions of Genera and Species.* Selman A. Waksman. Williams and Wilkins, Baltimore, Md., 1961. 372 pp. Illus. \$15.

Advances in Blood Grouping. Alexander S. Wiener. Grune and Stratton, New York, 1961. 561 pp. Illus. \$11.

Annual Review of Medicine. vol. 12. David A. Ryland and William P. Creger, Eds. Annual Reviews, Palo Alto, Calif., 1961. 462 pp. \$7.

The Bacteria. A treatise on structure and function. vol. 2, *Metabolism.* I. C. Gunsalus and Robert Y. Stanier, Eds. Academic Press, New York, 1961. 587 pp. \$15.

Biology and Comparative Physiology of Birds. vol. 2, A. J. Marshall, Ed. Academic Press, New York, 1961. 478 pp. Illus. \$14.

Cell Function. An introduction to the physiology of the cell and its role in the intact organism. L. L. Langley. Reinhold, New York; Chapman and Hall, London, 1961. 389 pp. Illus. \$7.50.

Communication among Social Bees. Martin Lindauer. Harvard Univ. Press, Cambridge, Mass., 1961. 152 pp. Illus. \$4.75.

Diagnostic Cytology and Its Histopathologic Bases. Leopold G. Koss. Lippincott, Philadelphia, Pa., 1961. 393 pp. Illus. \$16.50.

The Doubleday Pictorial Library of Nature: Earth, Plants, Animals. Josephine Perry, Ed. Doubleday, New York, 1961. 359 pp. Illus. \$9.95.

Elements of Zoology. Tracy I. Storer and Robert L. Usinger. McGraw-Hill, New York, ed. 2, 1961. 472 pp. Illus. \$7.25.

Explorations into the Nature of the Living Cell. Robert Chambers and Edward L. Chambers. Harvard Univ. Press, Cambridge, Mass., 1961. 376 pp. Illus. \$8.

Francis Walker's Aphids. John P. Doncaster. British Museum (Natural History), London, 1961. 172 pp. Illus. £3.

Functional Anatomy, Mammalian and Comparative. W. James Leach, McGraw-Hill, New York, ed. 3, 1961. 346 pp. Illus. \$6.50.

Growth, Development, and Pattern. N. J. Berrill. Freeman, San Francisco, Calif., 1961. 560 pp. \$10.

The Human Cerebellum. An atlas of gross topography in serial sections. Jay B. Angevine, Jr., Elliott L. Mancall, and Paul I. Yakovlev. Little, Brown, Boston, Mass., 1961. 147 pp. Illus. \$15.

Intermediary Metabolism in Plants. David D. Davies. Cambridge Univ. Press, New York, 1961. 120 pp. Illus. \$4.

Macromolecular Complexes. M. V. Edds, Jr., Ed. Ronald, New York, 1961. 263 pp. Illus. \$7. Proceedings of the symposium sponsored by the Society of General Physiologists, September 1959.

Manual of Clinical Bacteriology. Alexander Kimler, Lippincott, Philadelphia, Pa., 1961. 214 pp. \$4.75.

Mechanical Measurements. T. G. Beckwith and N. Lewis Buck. Addison-Wesley, Reading, Mass., 1961. 573 pp. Illus. \$8.75.

New Soviet Surgical Apparatus and Instruments and Their Application. M. G. Anan'yev. Translated by John B. Elliott. David Brooks, Ed. Pergamon, New York, 1961. 232 pp. Illus. \$12.50. Compiled from the proceedings of the first scientific session of the Scientific Research Institute for Experimental Surgical Apparatus, December 1956.

Oligocene Plants from the Upper Ruby River Basin Southwestern Montana. Memoir 82. Herman F. Becker. Geological Soc. of America, New York, 1961. 134 pp. Illus. + plates.

Orchids of Peru. Fieldiana: Botany, vol. 30, No. 4, pp. 787-1005. Charles Schweinfurth. Chicago Natural History Museum, Chicago, Ill., 1961. \$4.50.

Orthopädische Krankengymnastik. Friedrich Popp. Fischer, Jena, 1961. 170 pp. Illus. DM. 12.30.

Paper Electrophoresis. A review of methods and results. L. P. Ribeiro, E. Mitidieri, and O. R. Affonso. Elsevier, Amsterdam, 1961 (order from Van Nostrand, Princeton, N. J.). 475 pp. Illus. \$14.

The Plant Community. Herbert C. Hanson and Ethan D. Churchill. Reinhold, New York, 1961. 230 pp. Illus. \$4.95.

Vollwertige Ernährung und Gemeinschaftsverpflegung. J. S. Somogyi and H. Kapp, Eds. Karger, Basel, Switzerland, 1961. 193 pp. Illus. Paper.