

pages to 260 antibiotics. Mitomycin gets 64 lines, bacitracin a third as much, and there are 10 lines for tetracycline. Table 15 gives the phenol coefficients against *Salmonella typhosa* and *Staphylococcus aureus* for nearly 400 substances. There are brief descriptions of 130 culture mediums and of 76 microbiological reagents and tests, and 12 pages are devoted to 105 stains. There are also temperature conversion tables, tables of most probable numbers, and a listing of *Shigellae* and *Salmonellae* serotypes. Four tabulations outline bacterial, viral, and rickettsial diseases. Nine small tables deal with such subjects as the differentiation of *Neisseria* species. Toxins, antitoxins, and antisera and toxoids and vaccines are characterized in Tables 20a, b, and c. The last table diagrammatically illustrates four methods for preparing "test dilutions," a rather elementary note on which to end. The lack of a general index makes the book less useful. The volume contains surprisingly few errors for a first edition and is a useful book, but it is hardly a "handbook," in the old German sense.

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Physics and Archeology. M. J. Aitken.
Interscience, New York, 1961. x +
181 pp. Illus. \$6.

Archeologists are unusually fortunate in being able to capitalize on the researches of scholars in other disciplines, and this book ably summarizes some of the ways in which the techniques of physics can be applied to the solution of archeological problems. The author deals primarily with two fundamental facets of research: the finding of archeological remains and the dating of such finds. A final chapter is concerned with the physical and chemical analysis of specimens.

The finding of sites utilizes aerial photography (mentioned briefly) and instruments that recognize variations in remanent magnetism and in electrical resistivity of soils. These instruments (including the proton magnetometer) are particularly useful for finding individual features within a site, such as filled ditches or graves, buried floors, and ancient pottery kilns. Although such scientific detection methods have been proved effective in many cases, they

are still in their exploratory phases, and only a minority of archeologists have actually made use of them. This is partly because many archeologists have not yet acquired the instruments or learned how to use them and partly because problems in application sometimes defeat the techniques. As the author points out, buried horseshoes or natural pockets of moisture in the ground can register as strongly as the sought-for archeological features. However, these techniques will no doubt be more widely used in the future because they can certainly reduce the amount of expensive hit-or-miss digging now necessary in archeological sampling.

One chapter is devoted to the now well-established method of radiocarbon dating, and another to the somewhat less satisfactory techniques of magnetic dating; several other techniques for dating are mentioned briefly. The discussions are admirably organized, lucid, and informative; the author has successfully presented the facts without requiring the reader to have a specialist's knowledge to understand them.

One interesting example, in the final chapter (on analysis), is the use of chemical dating in analyzing Roman coins of the first two centuries A.D. These coins show a steadily decreasing zinc content, apparently due to loss of zinc when old coins were melted down and reused to make new ones. This example typifies the search for dating techniques—any measurable regularity through time is of potential value to archeology, for time is the archeologist's stock in trade.

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Scientific and Technical Societies of the United States and Canada. NAS-NRC Publ. 900. Compiled by John H. Gribbin *et al.* National Academy of Sciences-National Research Council, Washington, D.C., ed. 7, 1961. 512 pp. \$9.

An alphabetically arranged list covering 1836 professional and selected amateur societies in scientific and technical fields: Part 1 lists 1597 in the United States; part 2, 239 in Canada. Information provided about each society is concerned with its officers, his-

tory, purpose, membership, professional activities, and the like. Periodicals published by the societies as well as the names of their medals, prizes, awards, and lectures and trusts are indexed.

Living Fishes of the World. Earl S. Herald. Doubleday, New York, 1961. 304 pp. Illus. \$12.50.

This handsome volume reflects the broad background of a professional ichthyologist who has become intimately acquainted with many of the species about which he writes through his experience as director of Steinhart Aquarium and through field work in areas richly endowed with fish. To those who have not yet joined the growing ranks of skin divers, particularly along tropical shores, the kaleidoscopic natural colors in the 145 magnificent color plates may seem incredible. The beauty of the plates is greatly enhanced by artistic choice of backgrounds and by numerous interesting poses, closeups, and habitat shots.

After a brief introduction, Herald's discussion of fishes, which follows along systematic lines (essentially Regan's classification), ranges from the primitive jawless hagfishes and lampreys through the sharks and their allies to the so-called bony fishes (which include the majority of living species, approximately 15,000 to 20,000 kinds). He stresses groups less often treated in popular aquarium books. Characteristics, habits, range, and life history information are covered, and they yield such interesting facts as the use of "sonar" by African elephant fishes, the practice of intestinal respiration by Asiatic loaches, the maturing as functional females of certain sea basses that later reverse their sex to become functional males, and the "cleaning" of ectoparasites from large fishes, chiefly by small wrasses (illustrated in plates 27 and 98). Plates 80 and 83 show the striking sex dichromatism that occurs in the male and female of the same species of parrotfish (page 204).

Professional ichthyologists (for whom the volume was not written) may be mildly upset by the use of the terms "ventral" and "tail" fins, especially since many other technical terms are used. Some misstatements are inevitable in a work of this scope, and misspellings have crept in, but such minor discrepancies can be easily corrected in a re-

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. Rytand 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.