Book Reviews

Temperatur und Leben. H. Precht, J. Christophersen, H. Hensel. Springer, Berlin, 1955. xii + 514 pp. Illus. DM 78.

Temperature, as the authors justly state, "is one of the most important ambient factors that determine life on earth." However, no comprehensive review on temperature and life seems to have appeared since the books by Przibram, Běhlerádek, and others, which are now obsolete. The present volume fills this gap in the most satisfactory way, and the topic in question has found as superb a presentation as few others in modern biology have found. Because it is impossible to do justice to the wealth of material in a review, only the contents of the volume can be briefly indicated. Precht surveys poikilothermic animals and plants. After a brief introduction on the physicochemical foundations, the influence of temperature on life processes is treated in view of metabolic and developmental processes, adaptations, seasons, extreme temperatures, modifications, mutations, body temperature, behavior, distribution of organisms, and so forth. Christophersen reviews the microorganisms: influence of temperature on growth, multiplication, metabolism, adaptations, killing by heat and cold, heat resistance of microorganisms and enzymes, thermophilic organisms, refrigeration of foodstuffs, and temperature influence on spores, on poisoning, and so forth. The part by Hensel concerns man and homeotherms: body temperature, homeothermy as a feedback mechanism, formation and loss of body heat, nervous and hormonal controls, thermoreceptors, changes in thermoregulation, acclimation, temperature limits, ontogenetic development of homeothermy, hibernation, and influence of temperature on the geographic distribution of homeotherms.

As can be seen from this sketchy list, there is hardly a topic within the scope of the title that has not been fully treated. The comprehensiveness of the treatment is illustrated by the fact that the list of authors quoted contains about 3000 names. However, the presentations are much more than an enumeration of an enormous number of facts. The presentation is based largely on the authors' own work, and everywhere facts are fitted into a modern theoretical framework.

This standard work will prove indispensable for anyone working in the many fields of physiology, biology, and medicine that are connected with this topic.

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Modern Physics. John C. Slater. McGraw-Hill, New York–London, 1955. xi + 322 pp. Illus. $5.50.

John C. Slater of the Massachusetts Institute of Technology has himself contributed substantially to many of the fields discussed in his stimulating book, which conveys much of the spirit of research as well as a balanced view of the historical development and basic concepts of modern physics. Even readers familiar with Slater's earlier excellent and concise textbooks in theoretical physics will be amazed at the number of topics in this volume.

The first two chapters include the development of the atomic theory, kinetic theory and specific heats, electron theory, and relativity; as an illustration of the versatility of physical theories in the hands of great physicists, Slater includes here an especially interesting summary of the many successes of the classical electron theory of matter in explaining phenomena that are now considered to be inherently quantum-mechanical. The next three chapters treat the beginning of the quantum theory and the development of the Bohr theory of the atom. Then x-rays and atomic and molecular spectra are discussed in considerable detail, followed by a chapter that the author describes as a "very superficial sketch" of wave mechanics.

The next chapter of only 26 pages indicates how the quantum theory and Fermi statistics explain the main properties of atoms, molecules, and solids; especially outstanding here is the author's lucid summary of qualitative features of the Hartree self-consistent field method, the method of molecular orbitals, and other approximation techniques for the treatment of many body problems. The concluding chapter discusses nuclear physics and high-energy particles; among many other topics, this chapter includes a historical introduction, positrons and the Dirac theory of the electron, particle accelerators, nuclear reactions and nuclear-energy levels, fission and reactors, nuclear spins and magnetic moments, a discussion of nuclear forces and nuclear structure, cosmic rays, and elementary particles.

With so many topics in one volume, theoretical discussions are necessarily highly abbreviated, with many critical points omitted or introduced abruptly by "we find that . . ." or "it turns out that . . ." Many concepts are used without full explanation, so that the book will be comprehensible only to students who have already had approximately the equivalent of a B.S. degree in physics; for example, in the first chapter such concepts as Doppler effect and radiation pressure are utilized without definition, and Fourier analysis is tacitly employed. Thus the text is not especially suited for students who are learning modern physics for the first time but would be useful to students who are reviewing for B.S. or M.S. comprehensive examinations in physics, and I have recommended it for this purpose, particularly when the well-chosen problems at the end of each chapter are used. The highly readable informal style should also attract all instructors of physics or other physicists who wish to have a well-balanced summary of the essential features and spirit of modern physics.

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The Alkaloids, Chemistry and Physiology. vol. V. *Pharmacology.* R. H. F. Manske, Ed. Academic Press, New York, 1955. ix + 388 pp. $9.50.

This is the last of a series of five volumes dealing with the chemistry and pharmacology of alkaloids; it is designed to cover the latter aspects of these compounds. The material is arranged in 11 chapters prepared by different authors, namely, "Narcotics and analgesics," "Cardioactive alkaloids," "Respiratory stimulants," "Antimalarials," "Uterine stimulants," "Alkaloids as local anesthetics," "Pressor alkaloids," "Mydriatic alkaloids," and "Curare-like effects"; these nine are followed by two short chapters on "The lycopodium alkaloids" and on "Minor alkaloids of unknown structure." The various chapters are annotated with numerous references.

The title of the volume is not well chosen in that *physiology* refers to the