

Obesity and Diet

Physiological and Behavioral Aspects of Taste. Morley R. Kare and Bruce P. Halpern, Eds. University of Chicago Press, Chicago, Ill., 1961. xvi + 149 pp. Illus. \$6.

As Pfaffmann points out in a thoughtful preface to this book, which is the outcome of a 1960 symposium at Cornell University, taste, as a model stimulus-response system and as the mediator of powerful rejection and acceptance responses, has much to offer both the sensory physiologist and the behavioral scientist. The ten papers that comprise the bulk of this book stem from these approaches, although it is the behavioral aspects of taste, and their relation to food and metabolism, which are emphasized.

As is common in symposia volumes, the discussions are too often haphazard and diffuse; much of the material has appeared elsewhere; and the quality of the papers, both in style of presentation and in content, varies widely. In addition, this symposium, restricted as it was to a small group of American workers, does not give a comprehensive view of current research in this area. This is unfortunate, since the study of taste is a rapidly expanding field in which work of wide biological significance is in progress. Although some of these findings are mentioned in the preface, few of the papers suggest that recent, powerful techniques of biology are being applied to the basic problems in taste. However, a large and important section contains the discussions, and these are often effective. There is little evidence of extensive revision, and some sharp and even amusing exchanges that expose methodological differences are preserved. Little attempt is made to relate findings to what is known about other sensory systems.

Among the individual contributions, Jacobs expounds and criticizes the generally accepted view that osmotic factors can largely account for rats' long-term preferences for sugar solutions, and he suggests that caloric values are involved. Kare's paper is mainly a summary of his group's work on taste preferences in poultry, pigs, and calves, while Christensen covers the methodology of preference testing in rats, as developed by P. T. Young's group. Electrophysiological studies are represented by Kitchell, who makes some pertinent comments on quantification of neural

responses, and by Frommer, who summarizes his own and other important work on the representation of taste in the thalamus.

In an interesting review of research on taste in the Soviet Union, Pick presents material which is not otherwise easily accessible. Here, as in some other areas of Russian physiology, the Pavlovian conditional-reflex approach dominates to the virtual exclusion of electrophysiological and simultaneous choice techniques; Pick concludes that the main Soviet contribution in this area has been more to methodology than to fact. Other papers deal with the interaction of suprathreshold taste stimuli (Pilgrim), metabolic and taste interactions (Tepperman), metabolic factors in food intake and utilization in weanling rats (Heggeness), and "What is a sense?" (MacLeod).

The book is carefully edited and there is a useful terminal bibliography.

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Marine Biology

Fungi in Oceans and Estuaries. T. W. Johnson, Jr., and F. K. Sparrow, Jr. Cramer, Weinheim, Germany, 1961. xxiv + 668 pp. Illus. Plates. \$25.

The ships of a dozen nations are to comb the Indian Ocean in a major exploration of this least known sea; Congress is studying means to double our national effort on marine sciences; and the President of the United States has sent a special message to the Senate emphasizing the importance of marine research for the national safety and welfare. There could hardly be a more fitting time for the appearance of a scholarly monograph on an aspect of marine biology never before brought out between the covers of a book. The fungi in oceans and estuaries, as visualized by these authors, constitute an area of biological science that is relatively young, though its beginnings go back a hundred years; that is economically important, though its precise data are still far from complete; and that is fascinating because of the pioneering efforts already made and the broad vistas that are open for the future.

Biologists' libraries are well stocked

with books on almost every group of marine plants and animals, yet few biologists have wondered about the presence of fungi in the marine environment or have been concerned about their possible activities. Few even of the mycologists themselves have been more than dimly aware of the occurrence and the importance of fungi in the oceans. Among many thousands of described species of Mycota, some two or three hundred, we are now told, can be linked with fair certainty to those estuarine and ocean waters that are distinguished by their increased salinities and by numerous other hydrographic and ecological characteristics. Johnson and Sparrow are eminently qualified to weigh the evidence and present this account, the former by virtue of his active interest and research contributions to this field during the past ten years and the latter as an internationally known authority on and monographer of the aquatic Phycomycetes, who, as early as the 1930's, recognized the possible role of these and other fungi in pelagic waters.

Originally intended as a two-volume work, *Fungi in Oceans and Estuaries* was published in a single volume of two approximately equal parts—the first, a comprehensive and stimulating account of the general biology of these microorganisms; the second, a critical and useful treatment of their morphology and taxonomy. Two volumes would be more convenient to handle (the present one weighs close to 1.5 kilograms!), but combining taxonomic and dynamic aspects in one volume returns us to the fine tradition set by de Bary and reemphasizes the essential unity and interdependence of all facets of modern biology.

Among the numerous interesting features of this book, each reader or expert will find many to praise and some to complain about. The authors have concerned themselves with such fundamental aspects of marine fungi as their origin, their function in the marine environment, and their adaptation to it. The authors are equally forthright in stating that no clear picture of any of these aspects has yet emerged. No structural features that show a specific adaptation to salt water have yet been revealed. Indeed, the marine and estuarine fungi as a group appear to merge structurally and phylogenetically into the nonmarine, freshwater or terrestrial forms. One

does not gain an impression of two quite distinct and separate floras. With respect to the activities of marine forms, much stress is laid upon their saprophytic proclivities, more particularly in digesting wood. The exceptionally critical approach to this matter leaves the reader wondering sometimes whether marine fungi do in fact decompose woody materials. When we consider the extensive evidence at hand, however, and recognize the pronounced activity of wood-rotting terrestrial fungi, it seems that one can surely accept decomposition of submerged wood as a major activity of marine fungi. The authors' handling of parasitism—some parasites, such as *Dermocystidium* of oysters, *Ichthyosporidium* of fish, or wasting disease of eel-grass are far-flung and of obvious economic importance—is also somewhat obscured by what will seem to many readers an unnecessary pedantic and unhelpful distinction: that between pathogenesis and parasitism. Similarly, inserting the hydronium ion into considerations of pH is not calculated to clarify a subject still so unsophisticated as the physiology of marine fungi. While the taxonomic accounts are always carefully presented and very analytical, they are replete with doubts about the validity of many of the proposed taxa. Perhaps that is in the nature of mycological taxonomy, but nonmycological biologists are bound to be bewildered and irritated by the readiness with which new species of fungi are created, only to be seriously questioned soon after, not infrequently by their own authors.

Physically this book is a fine product of the printer's art, for which, however, the price seems unduly high. This is especially true in view of the fact that the text figures, useful as they are, are separated from their legends and assembled on plates at the very back of the volume, and are all simple linecuts, not one halftone being included. Students and monographers of microscopic fungi should long since have availed themselves of the modern methods of photomicrography to document their findings and descriptions. Another physical defect of the volume is the complete absence of numbering for any of the chapters, major headings, or subheadings. Moreover, the various sizes and kinds of type that are used for the several levels of headings have not been selected in any very helpful manner.

These and other shortcomings that might be noted are of minor significance when viewed against the high overall quality of this pioneering monograph. The coverage of the literature alone is a masterfully complete job. The writing is generally clear and forceful. The welding of a vast array of diverse material into one integrated and coherent area of biology is an achievement of which the authors can be justly proud. Their work marks the coming of age of marine mycology, and their book will no doubt become a classic in the field.

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British Textbook

Structural Principles in Inorganic Compounds. W. E. Addison, Wiley, New York, 1961. vii + 183 pp. Illus. Paper, \$3.25.

This book was written for first-year students in an English university, and it is on a level appropriate to American freshmen who have studied descriptive inorganic chemistry in high school. The author successfully accomplishes his purpose of presenting, in a nonmathematical but intuitively logical way, the fundamental consistencies in the structures of solids, many of which are available only in a few advanced texts, and even there are seldom presented in a collected fashion. Wide use of this book as supplementary reading in first-year courses should be quite effective in arousing students' interest in the inorganic chemical and structural fields; currently, both are minimized in many courses in favor of dilute physical chemistry.

The book starts with the aufbau principle and the periodic table, as might be expected, and continues with a short but clear description of various aspects of chemical bonding, including bond lengths, energies, ionic character, and so forth. The second chapter, on determination of structure by physical methods, is, in my opinion, the only really weak spot in the book, and it could well have been omitted from a work of this kind. Chapter 3, on the closest packing of spheres and the various types of structures of metals and ionic crystals that arise simply from packing considerations, and the

chapters that follow are excellent; these unifying concepts are presented clearly and in a manner easily comprehensible to serious students regardless of their background. Such physical properties of ions as radius ratio, charge, and polarizability are introduced as needed to coordinate structural types with known structures of crystals. More difficult to present, but still skillfully handled in a physically pictorial way, are explanations of directed bonds in molecules and of the structures of crystals containing covalent linkages as well as mixed ionic-covalent types such as those with polyanions. I doubt whether the ligand field theory of transition metal crystals has ever been discussed at this level; if it has not, Addison's treatment should serve as a model.

The book was written carefully and was read thoroughly in proof. Important structural types are exemplified by the most commonly encountered compounds, and the frequency of occurrence of possible types is always indicated. Illustrations are abundant. The text is short and does not attempt to cover completely so vast a subject; but it does not give the impression that important points have been skipped or treated hurriedly at the expense of understanding.

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Pharmacological Research

Annual Review of Pharmacology. vols. 1 and 2. Windsor C. Cutting, Ed. Annual Reviews, Palo Alto, Calif. vol. 1 (1961. viii + 479 pp.); vol. 2 (1962. vii + 477 pp.). Illus. \$7 each.

A periodic review of the basic scientific contributions in the field of pharmacology was long overdue, and therefore the publication of the first two volumes of this new series, entitled the *Annual Review of Pharmacology*, will be welcomed by all experimental biologists. The real value of these reviews lies in their primary emphasis on the basic scientific aspects of the discipline rather than on the use of drugs as therapeutic agents. The first volume, published in 1961, covers some 15 subjects of significant interest, five of which are reviewed again in 1962 by a new group of authors, along with a new series of topics. The repeated