and short on insight. In addition such calculations do not describe with useful accuracy important properties such as the relative energy of two alternative crystal structures or the electro-optic constants. The object of this modern outlook on bonding is to try to isolate the physics of bonding and to characterize empirically the unknown parameters and functions of this description. It has proved possible to find quantitative relations with predictive power for many important physical and chemical properties of a broad class of semiconductors. Two-thirds of *Bonds and Bands in Semiconductors* is a monograph on this subject, presenting work by Phillips (and by others he has strongly influenced) and the background necessary to explain and develop this frankly empirical outlook toward bonding and properties of solids. The remaining third is chiefly an exposition of conventional one-electron theory of band structure and optical spectra to connect the "bonding" ideas with energy bands in solids.

The professional materials scientist will find the monograph stimulating and informative. It discusses the relations between properties and materials in a way which brings many new insights to a reader who previously had some grasp of the theoretical constructs and the chemical systematics of the properties of solids. For such a reader, the book is relatively easy reading, chiefly because the author has attempted to present the subject as physically as possible and in as elementary a fashion as is consistent with describing the empirical phenomenology. Large sections of the book are material the professional knows, but often described from an unusual viewpoint. As a monograph, the book is at its best as a presentation of a coherent set of useful empirical relations. Chemists, engineers, and physicists interested in new electronic materials will find a working familiarity with this book a great asset. They will find the lack of detailed references to the original literature on experimental results and theoretical approaches annoying; the author gives only a few references at the end of each chapter, and those often to secondary sources.

The preface of the book suggests that the level is "typical of many introductory books on solid state physics." Many discussions are begun at a level which presumes considerably less knowledge than the usual reader of monographs has at his disposal. Since, to my knowledge, no existing textbook gives adequate coverage to the interdisciplinary area of this book, it is worth asking whether this book might itself be a useful text for a graduate course in chemistry, physics, or materials science. Unfortunately, the prerequisites for such a course would include a Kittel-level course on the phenomenology of solid state physics, some knowledge of the quantum theory of solids, and some understanding of conventional chemical theories of bonding. The book makes no pretense at a balanced view of important concepts—for example, in talking about effective charge without a discussion of the shell model of lattice vibrations it omits a major insight into the meaning of e^*. Chapters of the book are interrelated, and the student will not find it a book that can be studied sequentially. Finally, he will miss detailed references to partially covered subjects. Fortunately, these weaknesses for textbook use do not diminish the interest of this volume to those having a working familiarity with solids and semiconductors.

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Insect Physiology

The Physiology of Insecta. Vol. 1. MORRIS ROCKSTEIN, Ed. Second edition. Academic Press, New York, 1973. xvi, 512 pp., illus. $38.

To an ever increasing extent insects are being utilized to study basic questions in biology. This increased attention undoubtedly stems in large part from the facts that the genetic approach to the development and behavior of eukaryotes is gaining in popularity and that *Drosophila* is genetically the best known of all eukaryotes. With the influx of new researchers comes a demand for a ready source of information on the basic biology and physiology of insects. *The Physiology of Insecta* edited by Morris Rockstein, which first appeared in 1964, helped to satisfy this demand.

Now the series is being completely reworked. Besides an updating of the information, there will be an expansion of the treatise to six volumes. Chapters on bioluminescence, photoperiodism and circadian rhythms, pheromones, and other new topics are to be included in the new edition.

Each chapter presents a detailed overview of a particular aspect of insect physiology by an authority in that field and is written so as to be comprehensible to people outside the field. Thus, the chapters are generally not as inclusive or as critical as specialized review articles. Yet each includes an extensive list of references. These lists would have been even more valuable if the titles had been included. The lack is only partially overcome by having an author index for all works cited in the text.

The first volume to appear deals with the ontogeny of insects. J. de Wilde and A. de Loof begin with two chapters on reproductive processes. A rich variety of phenomena ranging from parasitic castration to traumatic insemination are concisely described, and the authors present succinctly the diverse endocrine mechanisms that regulate insect reproduction. The difficult subject of the biochemistry and physiology of embryonic and postembryonic development is covered by I. Agrell and A. Lundquist. In many instances they refer the reader to earlier reviews on one or another aspect of embryonic development, but unfortunately the most up-to-date reviews on those subjects (*Developmental Systems: Insects*, S. J. Counce and C. H. Waddington, Eds., Academic Press, 1972) were apparently not available to the authors and have not been included in the references. L. Gilbert and D. King present an excellent, thoughtful review of the endocrine aspects of insect development with a detailed summary of the chemistry of ecdysone and juvenile hormone. The last subject—insect aging—is one that has suffered from a lack of workers. This is very apparent from the article by Rockstein and J. Miquel. However, the physiological, biochemical, and ultrastructural data they present may help to direct work in this field of increasing relevance.

The upcoming volumes will consider "the insect and the external environment" and "the insect and the internal environment." In its new edition this series will be of value to researchers and students in all areas of insect biology.

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