approximate solution of a more realistic one. The distinction between that which is rigorously true and that which is "very probably nearly true" is never left fuzzy. Nevertheless, the book is neither overloaded with calculations nor sterilely formal. The essential pattern of the analysis is described, with the excruciating details omitted, and the results are neatly summarized and placed in a broad and general perspective. The historical introduction precedes reviews of exchange interactions in molecules and in solids, of angular momentum formalism (containing such little-known items as Schwinger's coupled boson representation of spin operators), and of relevant parts of molecular orbital theory. These sections provide a suitable summary of the background material needed by a student interested in magnetism. The portion of the book devoted directly to magnetism theory is less than 150 pages and consists primarily of two topics: an account of spin-wave theory in insulators and a discussion of the present status of the theory of magnetism in metals. These sections are outstanding in their clarity and originality, and I found them both interesting and instructive. The book concludes with a chapter on the simpler aspects of statistical mechanics in magnetic materials, and finally with a somewhat incongruous and lengthy excursion on the detailed solution of the two-dimensional Ising model.

To theoretically oriented students of solid-state physics, or to physicists specifically interested in spin systems, Mattis presents an account of magnetism theory stripped to its essential skeleton and written with authority and insight.

HERBERT CALLEN
Department of Physics,
University of Pennsylvania

Commonwealth and International Library of Science

Floral Biology. Mary Percival. Pergamon, New York, 1965. xvi + 243 pp. Illus. Paper, 20s.

The publisher, on the back cover, says that "This book, written for students, introduces them to the subject of floral biology, and gives them some idea of the scope of the subject rather than presenting them with a compendium of facts. The book is simply written, and contains a minimum of technical terms." The flavor of the book may be most easily conveyed by saying that every statement in this quotation is false. Its pages are filled with facts, and some idea of its simplicity may be gained from the fact that, in the first ten pages, an average of three new terms per page are introduced—for example, the following are introduced on page 2: *monoclinous, diclinous, monoecious, dioecious, gynomonoecious, andromonoecious*, and *trimonoecious*. The facts must run into the thousands, including such topics as ecology of anther dehiscence, composition of nectar, senses of flower-visiting birds, efficiency of birds as pollinators, pollination by bats, insect senses, flower form (in relation to pollination), the significance of phenology, bee flowers, fly flowers, moth flowers, butterfly flowers, isolating mechanisms in flowers, and many others.

The book is a textbook that falls into the error common to texts and to teachers: the persuasion that terminology is knowledge. American students, at least, would be entirely preoccupied by words like those cited above, to the exclusion of any real interest in flowers. But aside from its value to students, the book has a real value as a compendium of information, mainly about pollination. Results of many researches are reported in detail. A few typical examples are the percentage of protein in pollen, the relation of anther dehiscence to desiccation, the types of bills and tongues of flower-visiting birds, and the means by which pollinating insects communicate.

The text is illustrated by numerous photographs, doubtless from good negatives but muddy and unclear as reproduced, and by rather crude diagrams, which add little to one's understanding of floral structure. In figure 33, "right" and "left" seem to be reversed. Figure 45 is (to me) completely unintelligible.

The book ends with 98 references, besides a "bibliography" of 38 book titles, an "animal index," a "plant index," and a "subject index."

H. W. RICKETT
New York Botanical Garden,
Bronx Park

Steroids: Structure and Activity

Methods in Hormone Research. vol. 4, pt. B, *Steroidal Activity in Experimental Animals and Man*. Ralph I. Dorfman, Ed. Academic Press, New York, 1965. xii + 362 pp. Illus. $13.

This book, volume 4 in the series entitled *Methods in Hormone Research,* deals with selected topics concerning steroidal activity in experimental animals and man. It is therefore a continuation of volume 3, which has the same subtitle, and it similarly attempts to summarize and interpret the literature on the subjects under discussion. With few exceptions, no new data are presented.

The primary goals in the preparation of volume 4, as stated by R. A. Huseby, were to summarize the relative potency of various steroids, to correlate biological activities of steroid hormones in experimental animals with those in man, to correlate molecular structure with biological activity, and to summarize, when possible, the mechanism of action of steroid hormones. For the most part, these goals have been achieved.

The chapters on anabolic steroids, by Fred A. Kincl; antiandrogens, by Ralph I. Dorfman; and antiprogestational compounds, by Tomotsu Miyake and R. I. Dorfman, dwell extensively on the correlation between molecular structure and function and potency of many synthetic steroidal compounds. These reviews provide a needed summary of the fairly extensive literature on these subjects. All three chapters make liberal use of tables to present the data. In fact, the long text in Kincl's review adds little to its very complete and self-explanatory tables.

Three other chapters deal with the action of steroids on tumorigenesis and neoplastic growth. H. Brendler's review on steroids in reactivated prostatic cancer refers primarily to clinical studies. R. A. Huseby's chapter on steroids and tumorigenesis in experimental animals deals with spontaneously occurring and hormonally induced tumors in mice and rats. As the author points out, the presence of species and strain differences, as well as environmental and hormonal variables, adds to the difficulty encountered in utilizing animal data for the study of the hormonal regulation of human cancer. I noted a small error on page 151, where Crooke's hyaline changes which appear in the anterior

pituitary after prolonged adrenal cortical hyperfunction are confused with ACTH-secreting basophilic adenomas. Dorfman reviews the inhibition of tumor growth by steroids and presents in tabular form summaries of the qualitative effects of various steroidal compounds on a variety of tumor systems in mice, rats, hamsters, chickens, and guinea pigs.

The remaining chapters include a review, by R. E. Haist, of the literature on the effect of steroids on both the endocrine and exocrine portions of the pancreas, and another, by I. L. Bonta, on the effect of corticoids and ACTH on the induction of gastric ulcers in laboratory animals. The latter emphasizes once more how difficult it is to equate experimentally induced animal lesions to human disease.

The first and last chapters of this volume are excellent. The first, by A. Kappas and R. H. Palmer, is on the thermogenic properties of steroids. The other, by W. H. Fishman, is concerned with the influence of steroids on β-glucuronidase of mouse kidney. Fishman has pioneered much of the work on this subject, and his article contains a delightful exposition of many of his own contributions.

This volume provides a good list of references as well as a reasonable approach to most of the topics chosen for discussion.

DAVID E. SCHTEINGART
Department of Internal Medicine, Division of Endocrinology and Metabolism, University of Michigan

Frontiers in Physics Series

Phase Transitions. Robert Brout. Benjamin, New York, 1965. xiv + 202 pp. Illus. $9.

Phase transitions such as melting and boiling are familiar experiences, but their explanation from first principles of statistical mechanics still presents a major challenge to the theoretical physicist. The same is true of other, less familiar, phase transitions such as those that occur in magnetic materials, in fluid mixtures or alloys, in liquid helium-4 which becomes a superfluid, and in many metals which become superconductors at low temperatures. All these phase transitions have in common, by definition, some discontinuity or singularity in their thermodynamic functions. Beyond this, however, they all appear very different. Some of them —the liquid-vapor phase transition, for example—occur at such high temperatures that specific quantum effects are almost certainly unimportant and may thus be treated entirely within the framework of classical statistical mechanics. In others—for example, the normal-superfluid normal-superconductor transition—the low temperature state cannot even be described in classical terms. Surprisingly enough, the last of these is perhaps the best understood at present.

This book, which has grown out of a set of lectures given by the author at Los Alamos, "is an attempt to treat in parallel a set of phase transitions which superficially seem to be quite independent of each other, but which on further examination are seen to be manifestations of a common structure, the self-consistent field." The book contains the following chapters: "Introduction," "Ising model," "Condensation," "Freezing," "Ferromagnetism: Heisenberg model: Band theory of ferromagnetism," "Superconductivity," "Bose-Einstein condensation," "Theoretical refinement," and "Epilogue." Each chapter consists of an elementary part and a more advanced "graph theoretic" part which is starred. The elementary part contains a discussion, from the author's point of view, of the present state of theory in each field (as well as some experimental results). The starred parts contain much of the work of the author and co-workers up to the date of publication.

The idea of the self-consistent field goes back to van der Waals and Orenstein in the theory of fluids and to Weiss in ferromagnetism, and it has been most successful in giving a simple qualitative understanding of phase transitions. The extent to which this idea can be used as a starting point for obtaining a complete and quantitative understanding of phase transitions is still an open question however. The point of view expressed in this book (based to a considerable extent on the author's own work) is that the self-consistent field idea can indeed be pushed very far and that it serves to unite many fields. Even if one disagrees with some of Brout's ideas, which he states are "frankly biased," about how much credence can be given to certain types of approximations, the book will still be useful as an expert presentation of a particular point of view. It will thus be valuable to all scientists working in this very interesting (and currently fashionable) field, and it should serve the useful purpose of making the various "specialists" broaden their point of view and of giving them courage to look outside their own speciality.

Like many books based on lectures and written in the heat of research, *Phase Transitions* often causes one to wish that the author could be asked to pause (Sec. 2–3 goes on for 15 uninterrupted pages), and that he could be asked to explain some obscure passages (for example, the first paragraph on page 74). This should be corrected in the next edition.

JOEL L. LEBOWITZ
Relfer Graduate School of Science, Yeshiva University, New York

Soil Microecology

Ecology of Soil-Borne Plant Pathogens: Prelude to Biological Control. Kenneth F. Baker and William C. Snyder, Eds. University of California Press, Berkeley, 1965. xiv + 571 pp. Illus. $12.

A book such as this one is refreshing to read, for it covers all aspects of the ecology of soil-borne plant pathogens. In this day and age of specialization and departmentalism, the scientist is deluged with books on narrower and narrower subjects, often confined to the current fads of the year. This is not such a book! Although this interesting and fascinating volume is devoted primarily to the ecology of plant pathogens, much of the subject matter deals with broader topics. It might well be entitled "Soil Microecology." Portions of the book will be of interest not only to the plant pathologists, but also to ecologists, microbiologists, mycologists, and plant scientists.

This volume brings together the papers presented at a meeting entitled "An International Symposium on Factors Determining the Behavior of Plant Pathogens in Soil," held on the Berkeley campus of the University of California, 7 to 13 April 1963. Five years were devoted to the organization of the symposium, and more than 300 persons, from 24 countries, participated. The discussions following each formal presentation are included. In the