served on different scales, ranging from field observation to the electron microscope, his emphasis is on what is seen best in thin sections, under the petrographic microscope. More than a hundred clear and well-selected photographs and photomicrographs support the descriptions given in the text. Many new terms are introduced, but the profusion of terminology is only a reflection of the complexity of natural soil features. Some may not accept Brewer's terms or even the basis of his terminology, but a giant step has been taken toward putting pedography into an orderly framework.

Offsetting the complexity of the material are the clarity and honesty with which it is presented. Every term, beginning with *soil* itself, is defined after appropriate discussion of previous usages. The descriptions of pedological features are separated from the interpretations of their origins. Brewer has been careful to give the assumptions involved in making the logical jump from observed features to inferred processes. And he has made clear the contradictions in the available information, the uncertainties of current methods, and the gaps in the existing knowledge.

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Review and Résumé

Theoretical Physics. A. S. Kompaneyets. Translated from the second Russian edition by George Yankovsky. Gordon and Breach, New York, 1964. 392 pp. Illus. $9.50.

This English translation of the second edition of the original book, which was published in Russian, is a fairly standard work covering a range of topics in theoretical physics that one normally expects to find in a book with this title. In fact, one gets the impression that the book is intended as a miniature *handbook* of physics rather than as a textbook for use in the classroom.

The book is divided into four major fields, three of which are classical—that is mechanics, electrodynamics, and statistical physics—and a fourth which covers quantum mechanics and the quantization of fields. The style is terse and correct, if somewhat uninspiring, and the amount of material covered in the various sections is quite adequate. However, the treatment is never very deep or penetrating. The author is satisfied with stating physical laws and indicating some of their consequences, directly and precisely, without indulging in much discussion.

According to the preface to the first edition, the book is aimed at "engineer-physicists," biophysicists, chemists, and those in related fields—an audience more interested in the general structure and capabilities of theoretical physics than in specific details. If the book is read and evaluated on this basis, one feels that the author has succeeded remarkably well in producing a readable account of what theoretical physics is all about. The first chapter lays the foundation of mechanics of systems of particles. Generalized coordinates and Lagrange functions are introduced almost immediately, and the rest of the discussion is largely based on Lagrange's equations. Central field motion, collisions of particles, and small oscillations problems are all treated briefly, and brief mention is made of variational principles in mechanics. Chapter 2, which introduces the Maxwell equations, is preceded by a useful introduction to vector operations and vector identities that occur in the later development of this chapter. In fact, a useful feature of the book is the maximum use that is made of vector notations and vector manipulations. Users in this country may be worried by the unfamiliar bracket notation [A, B] for the vector product of A and B, and the use of "rot" for "curl."

The last two chapters, on quantum mechanics and statistical physics, form the most useful part of the book. The section on quantum mechanics touches most of the standard problems in this field, introduces and discusses electron spin, and even considers many-electron systems and the quantum theory of radiation. The last chapter provides a concise account of the ideas of statistical physics and thermodynamics and of their application to equilibrium (and some nonequilibrium) problems.

Of course this book will have to compete with the many excellent textbooks that are already available in the various domains of theoretical physics.

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Hybrid Computers

Electronic Analog and Hybrid Computers. Granino A. Korn and Theresa M. Korn. McGraw-Hill, New York, 1964. xxiv + 584 pp. Illus. $17.50.

In the recent history of computing the enthusiasts for analog and for digital computers have often been loud in their claims for their favorite and almost totally ignorant of the advantages of the other machine. The experts who prefer the analog machine have slowly adapted some of the digital techniques to their needs, but the corresponding observation cannot be made with respect to the experts who prefer the digital machine, for they are usually still quite ignorant of the use and advantages of analog computers. Fortunately there is a small, but active, school (including the authors of this book) who are expert in analog computers and well aware of digital computers and are therefore prepared to use the two in a hybrid combination. Hybrid computing, when well done, uses the advantages of both but at the same time recognizes that some of the disadvantages of both must be accepted. Although the hybrid field is not new, little is known about it because so few capable people have worked in the field. Fortunately this book treats both analog and hybrid computers.

The book begins with an excellent section, Principles of Electronic Analog Computation (74 pp.). In this section the authors treat the usually vexing topic of scaling (especially time) quite well, and the presentation of this material reflects the effect of more than a decade of polishing.

The main part of the book, Design of the Basic Computing Elements (296 pp.), is undoubtedly the finest part. Here the authors speak with real authority on both vacuum-tube and solid-state circuits, and, to my pleasure, they frequently give their personal opinions, based on their long experience, about various matters.

The third part of the book, Analog Memory, Hybrid Analog-digital Computation, and Computer-system Design (132 pp.), covers the vast array of special circuits that occur in modern analog and hybrid computers; it also contains a bit about how to put them all together to get a good machine.

The fourth part, Advanced Computer Utilization (48 pp.), covers hybrid computers among other things, and provides