

ductory description of the mountain range and of adjacent areas from the standpoint of geology and climate as well as of vegetation types.

This is a useful local manual which is well prepared and which will be especially valuable for botanists and others in the region who wish to key out quickly the local species. For this purpose, the relatively simple keys should be useful, but they are oversimplified for application to the flora of the state as a whole. Statements of geographical distribution of species are restricted to the Santa Cruz Mountain localities, and the reader is referred to other works for general distribution.

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Boolean Algebra

Boolean Algebra and Its Applications.

J. Eldon Whitesitt. Addison-Wesley, Reading, Mass., 1961. x + 182 pp. Illus. \$6.75.

This is a text for a one-semester college course presupposing only a limited mathematical background. The course could be for either good engineering students or practically inclined students of mathematics.

In chapter 1 Whitesitt develops the algebra of sets intuitively from Venn diagrams, discovering the basic properties of complementation (denoted by $'$), union (denoted by $+$), and intersection of sets (denoted by \cdot or juxtaposition). In chapter 2, Boolean algebra is formalized from minimal postulates. The Stone representation theorem—that every abstract Boolean algebra is isomorphic to an algebra of sets—is stated but not proved. In chapter 3 the author treats the algebra of propositions in symbolic logic. He occasionally goes beyond Boolean algebra to discuss quantifiers and rules of inference. But the basic theme is the use of Venn diagrams and the formal simplification of propositional functions.

Chapters 4 to 6 are on the engineering side. After showing the use of Boolean algebra in series-parallel circuits, the author treats more complicated circuits, showing how to reduce them to series-parallel form. The design of n -terminal, double-contact switching circuits is discussed lightly. Next one reads of sequential relay circuits and, in chapter 6, of half-adders, adders, and

even parallel multipliers for digital computers. Chapter 7 discusses probability in finite sample spaces.

There are many illustrative examples, exercises for the reader (many involving complicated verbal puzzles to be untangled), and about half a dozen references at the end of each chapter. Answers to selected problems are provided at the end of the book.

I found the book very readable and informative. In addition to the applications, many important mathematical ideas arise naturally and simply in this subject (for example, duality, isomorphism, function), and these might justify such an off-beat course in a modern mathematics curriculum. But, on balance, for mathematics students the book and the subject appear better suited for self-study. I cannot judge the book as an engineering text.

The author's definition of a function (page 33) as an expression cannot be condoned in 1961. I was surprised to find so little use of the Karnaugh-Veitch diagrams which are so popular among engineers.

A closely related book is Franz E. Hohn's *Applied Boolean Algebra, an Elementary Introduction* (Macmillan, New York, 1960).

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Relativity for the Layman

What Is Relativity? L. D. Landau and G. B. Rumer. Basic Books, New York, N.Y., 1961. vi + 72 pp. Illus. \$1.95.

This book, which is being published in Basic Books' Science and Discovery Series, is a translation from the Russian, the authors being well-known physicists of the Soviet Union. The translator, N. Kemmer, is himself an internationally known British physicist. With this formidable authorship, the book is a charming exposition of the basic principles of the special theory of relativity, intended for the youthful lay reader and enlivened with some 20 freehand sketches, some of them amusing, all instructive. The scope covered by this brief presentation is strictly limited; it is confined to a thorough conceptual exposition of the foundations of the theory, a discussion of the kinematic effects of special relativity, and an explanation of the vari-

ability of relativistic mass. The authors have avoided the use of even the simplest algebra; but they do use arithmetic calculations to illustrate their qualitative arguments. Nevertheless, the book is penetrating, rather than descriptive, and makes demands on the intellectual capabilities of the reader. It can be warmly recommended not only to high school students but also to college students who are not primarily science-minded.

The publishers are to be commended for having held the price down to a nonrelativistic level, even though they have provided the volume with a standard hard cover and a tastefully designed dust jacket.

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Econology

Bargaining and Group Decision Making. Experiments in bilateral monopoly. Sidney Siegel and Lawrence E. Fouraker. McGraw-Hill, New York, 1960. x + 132 pp. Illus. \$4.90.

This book is one of the fruits of the interdisciplinary tree and one that may be equally palatable to both of the disciplines involved, namely, economics and experimental social psychology. It was awarded the Monograph prize of the American Academy of Arts and Sciences for 1959 in the social sciences. The authors point out that economics is the most advanced theoretically of the social sciences, while psychology is the most advanced in rigorous empirical methodology. The marriage of the strong aspects of the two disciplines has produced what appears to be a viable hybrid (econology?) consisting of explicit hypotheses for the psychologist to test and resulting modifications of theory for the economist to encompass and expand.

The experimental technique designed to test deductions from economic theory is simple and elegant. Pairs of college students were provided with isoprofit tables describing precisely various profit levels (in real money!) attainable and the prices and quantities of product X to be exchanged in order to reach certain levels of profit. The result of the ensuing bargaining between buyer and seller is that each goes home with the amount of money he decides is his largest possible profit. Bargaining is

done in isolation by passing numerical price and quantity bids back and forth via the experimenter until the contestants are satisfied with the bargain achieved.

The hypotheses tested by these laboratory experiments centered around the case of equal bargaining strength, the theoretically indeterminate case. The main hypothesis, that contracts negotiated under simulated, bilateral, monopoly conditions will tend to the quantity which maximizes joint payoff, was confirmed. By varying cost and revenue functions, the generality of the result was established. It was further shown that personal characteristics of the bargainers enter heavily into the determination of differential payoff and price. The variability of contracts around the maximum joint payoff appears to be controlled by the amount of information the bargainers have. Results are reported for the complete-complete, incomplete-complete and incomplete-incomplete information cases.

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Third Ur Kingdom Archives

Sumerian Economic Texts from the Third Ur Dynasty. A catalogue and discussion of documents from various collections. Tom B. Jones and W. Snyder. University of Minnesota Press, Minneapolis, 1961. 421 pp. Illus. \$10.

Administrative and economic texts from the archives of the third Ur kingdom (end of the 3rd millennium B.C.) already published are approaching the 15,000 mark, but a large number in public and private collections all over the world remain unpublished. And, of course, complete archives from the same period are probably still buried in the sands of southern Iraq. This extraordinary wealth of source material, unmatched by that of any other period of antiquity, is nevertheless difficult to digest: the large number of texts, the dispersion of the publications (some of them rather inadequate), the large amount of necessarily tedious preparatory work, and last but not least the language difficulties have until now prevented the preparation of a reasonably complete synthesis useful to historians of economics and technology.

The present volume represents a contribution towards that goal, without intending to be in any way a complete exposition of the available material. The catalog comprises 354 new pieces, most of them from the collection of the Rosicrucian Egyptian, Oriental Museum in San José, California; the others are from eight or nine different public and private collections. The texts are given in transliteration only, except for a few copies of difficult cuneiform passages. A good deal of attention was given to presenting the individual texts as clearly as possible (see, for example, the tables accompanying No. 78). The commentary consists of 11 independent chapters on selected points touching not only on the texts presented by the authors but also on questions arising from the whole corpus concerned with the third Ur dynasty; the reconstruction of the prosopography and administrative frame of Durem will be specially welcome for future research. A useful bibliography, intended to supplement the one given by Oppenheim in his catalog of the Eames collection (still the most informative and well-balanced work in this field), and comprehensive indexes complete the book.

However the synthesis of all Ur III material is yet to be made, and basic questions remain unanswered: Is the available material a representative sample of the economic life of the period? Which sectors of this economic life are represented and which are excluded? As is true of all reconstructions, we must first study carefully the limitations of our material to avoid unjustified extrapolations and the abuse of the arguments *ex silentio*.

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Computer Technology

Digital Applications of Magnetic Devices. Albert J. Meyerhoff and others, Eds. Wiley, New York, 1960. xix + 604 pp. Illus. \$14.

In the computing industry the magnetic core has become the accepted device for large-scale storage of information because of its high reliability even under adverse conditions, its high speed capabilities, and its low energy expenditure. Most of the cores in digital computer systems are used for high-speed

memory; however, they are also employed as logical circuit elements. The present text is mainly devoted to the latter applications. Much of the material is available in appropriate journals in less complete form; some of the topics have been considered in more general texts, but not as comprehensively as in this treatment. The editors have performed a very useful service in providing a one-volume, systematic treatment of an important field of digital technology.

The book, a reference text in the field of digital magnetic circuits, emphasizes the utilization of magnetic core circuits in the implementation of logical functions in digital systems. Although it consists of chapters written by 25 active workers from six industrial organizations, the volume is a well-organized and well-edited, unified presentation. Following the first part which discusses the fundamentals of magnetic core circuit technology, the six remaining parts cover particular areas of application. Each part consists of an introductory chapter explaining the general philosophy of the devices under consideration and of chapters discussing detailed circuit design, logical design, and systems design. Many references are cited, and the index is well prepared and complete.

The treatment of subject matter is, on the whole, clear and understandable. The section devoted to magnetic core memories is limited in scope to systems design. The editor justifies his position by stating that the existing literature covering this area is more extensive than that covering the topics he chose to elaborate on, but I feel that more could have been written here. The book should provide the digital systems designer with a set of digital techniques which have proven to be useful and reliable.

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Reprints

A Course of Analysis. E. G. Phillips. Cambridge Univ. Press, New York, 1960. 369 pp. Illus. \$2.95.

Culture Methods for Invertebrate Animals. Paul S. Galtsoff *et al.* Dover, New York, 1961, 522 pp. Illus. \$2.75. Prepared by American zoologists under the direction of a committee of AAAS Section F. Contains 313 articles covering 17 phyla. First published in 1937.