

a frequently encountered human factor, and it may be a hard one to eliminate. Next, the editor may regard a certain topic well enough covered in one or two articles not to plan for a separate heading, since neither size nor space is unlimited. The editor, no doubt, has to curb many an author who understandably might be carried away with enthusiasm for his own subject. But on the whole the space allotment seems fair, with precision and compactness the general rule. Since judgment is difficult, here are some examples: Carbon dating, $3\frac{1}{4}$ columns; coloration of animals, 13 (this includes three columns of various chemical formulas); endocrine system, 9; plastid, $3\frac{1}{3}$; pineal, 1; endogenous rhythms, 2; photoperiodism (plant), $3\frac{1}{2}$; genetic drift, 2; salt marsh, 2; primates, 9; population genetics, 9 (including all major equations).

While the idea of including biographical sketches is a valuable and pleasant diversion in a volume of this kind, the inclusion of such names as Agnes Arber, but not C. B. Bridges or E. B. Wilson, presents a problem. Moreover, many of the historical sketches are quite superficial and faulty. Entirely false and even expendable is the paragraph on Giodanao Bruno; Wöhler did not synthesize urea but found it in the reaction system; Johannes Müller's somewhat flippant biographical sketch lacks the spirit of that great man.

However, all factors considered, the verdict remains as originally stated. The volume is an excellent pioneering venture of immense value to every teacher and student of biology. It is thorough, authoritative, up to date, and it is exceptionally strong in reporting the latest researches in most fields of biology. It is beautifully illustrated, well cross-referenced and indexed (with minor lapses here and there which should be corrected in revision) and with more-than-hoped-for coverage. The style is so lucid that any alert high school student can consult most entries with profit. Such a student may find quite a few wholly incomprehensible because they presuppose considerable knowledge of chemistry, physics, and mathematics. But these provide references to fuller texts; besides, if he goes so far as to seek out these references, he may be able to plough through with some profit. Even the hard ones give him the opportunity to do so.

And all this in one volume—and at a relatively tolerable price for such an enterprise.

Two Congos

Congo. Background of conflict. Alan P. Merriam. Northwestern University Press, Evanston, Ill., 1961. xiii + 368 pp. Illus. \$6.

Alan Merriam, an anthropologist at Northwestern University, has been in the Belgian Congo for extensive research visits on two occasions: in the early 1950's, when the Congo was still regarded by many as the "model colony," and in 1959 and 1960, during the transition to independence and, as it turned out, chaos. From this personal background and from a wealth of detailed information garnered from many diverse sources, he has written a book which, though focused on events that have not yet run their full course, provides an overview valuable not only for an understanding of what the Congo is like now but also for an understanding of the kind of stage upon which future events will unfold.

The volume begins with a short introduction that considers historical, geographic, and ethnographic matters and then turns directly to Belgian colonial policy whose guiding principle of paternalism, with the usual colonial components of cupidity intricately interwoven with a measure of sincere but prideful and insensitive idealism, serves to explain much of the background out of which later events grew, swiftly, disastrously, and yet, as Merriam makes clear, not really inevitably. One of the most interesting chapters describes, in concretely human terms, how independence came to two "Congos" (all too often only one or the other is talked about in isolation): the Congo of the interior (in this case, the village in which Merriam resided during most of his field research) and the Congo of the urban center (Stanleyville being the example used). After these descriptions, the detailed, more purely political narrative of parties, leaders, negotiations, and the vicissitudes of pre- and post-independence politics becomes more understandable to the reader, more consistent in its apparent lack of logic. Merriam has happily chosen to present many of these facts in the framework of a calendar of specific events. With the feeling of immediacy that it gives, this calendar will remain invaluable in any future discussion of the series of Congolese debacles, for already the accidental is too often forgotten and the small but crucial event tends to disappear as sweeping mytholo-

gies, always so appealing in their simplicity, begin to take shape. There is a sobering aspect to this retrospective view; if the Congolese villager and townsman are found to have been unrealistic in their expectations, so are many of the supposedly more sophisticated analysts—on one side, the Belgians and the apologists of the "perfect colony" who were blind to the dynamics of a continent which they forgot existed at all; and those on the other side who, fascinated with general trends, impatiently ignored the role of the unique and concrete fact and hailed the hasty Belgian capitulation as a show of political realism.

Mercifully, the reports from the Congo have left the front page in recent weeks. It would, however, be unforgivable for us to slip once again into forgetting that the Congo exists. This book will amply prepare the reader to avoid this error; and it will prepare him not only to expect more news but also to understand the news better when it does come.

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California Flora

Flora of the Santa Cruz Mountains of California. A manual of the vascular plants. John Hunter Thomas. Stanford University Press, Stanford, Calif., 1961. viii + 434 pp. Illus. \$8.50.

The Santa Cruz Mountains of California form the backbone of the peninsula west of San Francisco Bay and north of Monterey Bay. Although the range is only about 50 miles long and 2000 feet high, the flora is rich and varied. The mountains dip down into the ocean on the west, and the flora is coastal. Above the beaches and cliffs are extensive areas of redwood forest (Pacific Forest). This vegetation type occurs also in the more moist canyons on the east slope of the range, but most of the drier inland side is covered by California Chaparral. The inland foothills are California Oak Woodland. Thus the flora of the Santa Cruz Mountains includes a high percentage of the species occurring in the lowlands of northern California.

The text includes distributional notes, keys to the families, genera, and species, some synonymy, and intro-

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