then proceeded to work out their own distinctive forms.

Thor Heyerdahl's "Navel of the world: The red-topped giants of lonely Easter Island" (pp. 323 to 344) is the last essay. It is fitting that the volume ends with Polynesia, because it was the last major part of the world settled by man, but a more balanced presentation of this event would have been preferable. Heyerdahl is the only contributor who limited himself to one of two opposing and controversial interpretations and who presented only the facts that favor his interpretation. The reader should bear in mind that migration from Peru, which Heyerdahl presents with such conviction, is not the only side to the story of the Easter Island statues. If the reader is interested in the alternate view, he may obtain it from the following publication, which is not included in the otherwise comprehensive bibliographies at the end of the volume: *The Island Civilizations of Polynesia* by Robert C. Suggs.

One theme ties the articles together: they all deal with peoples who were marginal to the centers of civilization in their times. The volume could have been given more unity by emphasizing this theme. It would have been interesting, for example, to inquire into the nature of the blend between local traits and influences from the centers, which is shown by all the civilizations discussed. One wonders about the effect of trade with the centers (see, for example, the plaque illustrated in the figure). Why did many of these peripheral civilizations preserve earlier customs and styles of art, which had gone out of fashion in the centers? Why did they have little or no writing? And what, in general, was the result of being in a peripheral position?

A more balanced coverage of the marginal peoples and civilizations would also have been desirable. For example, the Norse, the Pueblo Indians, and the mound builders of the eastern United States might well have been substituted for the Maya, the Sarmatians, and the megalith builders of western Europe, all of whom had been treated in the first volume, though in less detail. Nevertheless, the editor is to be commended for bringing us an authoritative view of some lesser-known civilizations, which are usually not included in compendia of this kind.

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Number Theory

Elementary Theory of Numbers. W. J. LeVeque. Addison-Wesley, Reading, Mass., 1962. viii + 132 pp. $5.

A Second Course in Number Theory. Harvey Cohn. Wiley, New York, 1962. xiii + 276 pp. Illus. $8.

LeVeque's *Elementary Theory of Numbers* is written in somewhat more leisurely fashion than a number of beginning textbooks on the subject, including the first volume of his own two-volume work. It is intended for use by teachers, and the author hopes that it will enrich high school courses and serve as an introduction for college students. LeVeque begins with a discussion of number theory and of some of its methods and solved and unsolved problems; he gives some attention to proofs by induction and indirect proofs, since in this subject such proofs are frequently used.

The volume is concerned with the Euclid algorithm and its consequences, linear and polynomial congruences, primitive roots of a prime modulus, continued fractions, and the Pell equation. The quadratic reciprocity law is not dealt with. There are many historical references, and the author frequently sketches the idea of a long proof before embarking on its formal development. Many examples are worked out, and exercises of varying degrees of difficulty are given. The book is most suitable for use as a textbook.

A Second Course in Number Theory presupposes knowledge of the usual beginning course in number theory through the quadratic reciprocity law. The approach is developmental in that Cohn continually points to what is ahead and shows what is needed for the proofs that are later developed. The content is strongly algebraic, with special emphasis on quadratic fields.

The first two chapters provide a preview of some of the paths that are followed (for example, composition of binary forms and primes in an arithmetic progression), a review of basic concepts, and preliminary discussion of abelian groups. The third chapter deals with characters and culminates in Dirichlet's lemma that any real character modulo m can be expressed in terms of Kronecker's symbol. The fourth and fifth chapters consider integral domains and lattices, leading to a proof of Kronecker's theorem on abelian groups, and some results on minima of quadratic forms.

Part two is concerned with ideals and ideal classes and their connections with the geometry of numbers.

In the final part, previous results are applied to establish a relationship between Dirichlet L-series and the binary class number to prove Dirichlet's theorem on primes in an arithmetic progression and Weber's allied result that every ideal class of a quadratic field contains an infinite number of primes. The author closes with an ideal-theoretic proof of the quadratic reciprocity law, the composition of forms, equivalence classes, class numbers of orders of binary forms, and Hilbert's symbol. Possible further extensions are described.

The exercises are an important part of the development of this clearly written book. The choice of topics is unusual, and an amazing amount of ground is covered. By working through the volume, the careful and studious reader should acquire much of the flavor of modern developments in number theory.

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Ecology

Animal Ecology. Aims and methods. A. MacFayden. Pitman, New York, ed. 2, 1963. xxiv + 344 pp. Illus. $10.

This second edition of a book originally published in 1957 reflects both the large accrual of information and the changes in perspective that have characterized ecology in the last few years. Much of the book is new. Of its three major divisions, which deal respectively with the ecology of individuals, populations, and communities, the last contains the largest additions. MacFadyen expresses the sanguine point of view that fragmentation within ecology is decreasing, and he justifies that viewpoint with a relatively successful attempt to bridge the gaps between the study of populations and ecosystems by means of a metabolic approach. Although his interest in soil invertebrates is very much in evidence, he presents major ideas in a well-balanced manner Documentation is extensive; it is particularly pleasing to find evaluations of

a variety of suggested solutions to general problems.

Mathematical formulations are described where necessary, and the need for statistical treatment of data is emphasized. An intelligently critical attitude pervades much of the discussion. In the first half of the book special appendixes are devoted to descriptions of specific methods. These seem uneven in value, and at best they provide a searching review—for example, the section on metabolism. In other cases they are elementary or will become dated too quickly. Typographical and more serious errors are few, although the otherwise excellent short discussion of dispersions is hurt badly by two of the latter. The graphs and illustrations, which were selected for their originality, are in some instances not as easy to interpret as one could wish.

In the first edition, the author addressed himself to the intelligent layman as well as the professional worker. This edition will be rough sledding for the nonspecialist. So much material has been crammed into what remains a relatively small volume that terseness loses its virtue. Especially in the section on biocoenology, it is sometimes impossible to understand what the author is saying without recourse to the original literature that he is trying to summarize. The writing style, which is at times abstruse, contributes to this difficulty.

This volume, like other recently published brief but penetrating treatments of segments of ecology, will be best appreciated by, and will have the greatest influence on, reasonably advanced students.

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Biological Nomenclature

Naming the Living World. An introduction to the principles of biological nomenclature. Theodore Savory. English Universities Press, London, 1962; Wiley, New York, 1963. xiv + 128 pp. $3.95.

The need for an internationally recognized system of nomenclature under which each kind of organism is provided with a scientific name is so evident to systematists that few of them devote time to publicly justifying this primary assumption. Nomenclature is an indispensable adjunct to taxonomy, and this branch of science and its sister sciences depend heavily upon the orderly though still imperfect system of nomenclature now in use.

This small volume was written by a practicing zoologist whose keen sense of humor and scholarly approach to his topic make for pleasant and informative reading. The first four chapters are admittedly elementary, and they are intended as an introduction for biology students. They are concerned with the need for scientific names and the origin and construction of such names. The next six chapters deal with the development of internationally acceptable rules governing nomenclature. The development of the botanical, zoological, horticultural, and bacteriological codes are traced; certain special codes, which have a more restricted application, are also mentioned. Subsequent chapters deal with many concepts and practices familiar to taxonomists—good taste in the selection of names, linguistic problems, categories of classification, and the development of indices to scientific names used in the literature of both plants and animals. In the final chapter the relationship of systematics and nomenclature is discussed; this chapter concludes with a list of the essential elements common to all codes of nomenclature and a series of recommendations designed to guide in the choice of names.

It is manifestly impossible to discuss so technical a subject without delving rather deeply into matters that primarily interest taxonomists, yet anyone with a little familiarity with the biological sciences can find something of value in this small book. Being a zoologist, the author understandably is more intimately familiar with the zoological than the botanical code of nomenclature, and his botanical colleagues will find minor points with which they disagree in some of his remarks about their code. The fundamental fact is, however, that systematists on every hand are working towards the same goals of orderliness and stability in biological nomenclature, and although their methods differ in some small details, the methods are basically alike.

This book is well written and authoritative, and its style is such that it should provide interesting and informative reading for the scientist as well as the scientifically oriented segment of the general public.

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Chemistry of Carbohydrates

Comprehensive Biochemistry. vol 5, *Carbohydrates.* Marcel Florkin and Elmer H. Stotz, Eds. Elsevier, New York, 1963. xvi + 328 pp. Illus. $14.50.

This volume is intended, presumably, to deal with the chemistry of carbohydrates in a way that will be useful to biochemists. In this resolve, it is singularly unreliable, uneven, and unsuccessful.

The book is multiauthored, and the varied styles and approaches make this apparent. Many of the writers must be considered to be experts on their subjects, since they have published much of the same material in better form in other reviews or books. To weave this expertise into a useful book is a laudable aim, but it didn't come off.

A reading of chapter 1, which deals with the monosaccharides, reveals (on p. 28) that Adams' catalyst (Pt) is used for hydrogenolysis of benzyl esters; (p. 29) that nucleic acids contain O-glycosyl linkages; (p. 31) that fructose contains five carbon atoms; (p. 34) that the furanose ring of sugars is planar; (p. 35) that the pyranose ring of a sugar in a chair conformation has six axial substituents; (p. 48) that the silver salt of diphenylphosphate can react with an alcohol to give the triester; (p. 49) that diphenylphosphorochloridate has an oxygen between phosphorus and chlorine, that all esters of phosphate are labile to alkali, that the effect of alkali on glucose 6-phosphate is simple hydrolysis, and that the hydrolysis of phosphate esters occurs only by fission of the P-O bond; (p. 53) that the reaction of Brigls' anhydride in Lemieux's classical synthesis of sucrose occurs with inversion of configuration; and (p. 54) that the conversion of phenyl β-D-glycosides to 1,6-anhydrides is "hydrolysis."

This list of typographical errors, careless mistakes, and misleading and superficial statements is an indication of a woefully inadequate editorial policy. Biochemists are entitled to something more than this as an introduction to carbohydrate chemistry. In this age, when the most delicate studies of molecular conformation, catalysis, and reaction mechanism are being made by biochemists working with enzymes, such a treatment cannot be taken seriously.

The uneven development given to the different sections of the book is illustrated by comparing chapters 7b