not native to them. Such introductions are in effect evolutionary experiments. The analysis of the interactions among the invading individuals and between them and the native species pertains to a field of evolutionary biology in which genetics and ecology interact closely. This subject of ecological genetics has recently received considerable attention at the hands of both geneticists and ecologists. Persons interested in this field will find this book a mine of factual information with a good many principles and theoretical models discussed as well. The types of colonizers, the genetic and reproductive systems exhibited by them, their ecological tolerances, and their presumed evolutionary strategies are discussed for a wide variety of organisms.

A detailed discussion of the material contained in this book would require an extended review. Merely listing the titles and authors of the 27 contributions in this volume would require a sizable paragraph. I shall therefore exert the reviewer's privilege of singling out those of the many admirable contributions that I found especially thought provoking because of their relevance to problems of interest to me. Waddington's introduction to the symposium, in which he discusses evolutionary strategies of colonizing species, shows his usual masterly touch. Few evolutionists can pack as many important ideas into a few paragraphs as can Waddington. A population genetic survey of self-pollinating species of plants, by R. W. Allard, reveals surprising phenotypic and genetic variability engendered by even a low level of outcrossing. R. G. Lewontin, in a clever manipulation of the equation for the stable age distribution, arrives at some important evolutionary consequences of modifications of biotic parameters. A discussion of genetic differences in various components of growth and nutrition of *Drosophila*, by F. W. Robertson, aids an understanding of competition phenomena observed in several fly species. Fascinating experiments on intraspecific competition and migration in plants and animals are summarized by Kan-ichi Sakai, while J. J. Harper discusses the ecological interactions between weeds and the invaded native species. Frank Fenner presents a good account of the dramatic co-evolution of rabbits and their pathogenic Myxoma virus. A thorough review of chromosomal polymorphism in various species of *Drosophila* is offered by H. L. Carson, who feels that widely distributed species arise from marginal, frequently chromosomally monomorphic populations. Various authors provide interesting accounts of several groups of weeds.

Discussions, apparently transcribed from tape recordings, follow all of the papers. Such discussions often are very valuable in elaborating on the thinking of a given author and in bringing out aspects that he failed to stress. However, not all of the published comments are useful in this manner, and I am more than ever dubious about the wisdom of faithfully reporting discussion verbatim or nearly so. Some of the comments reproduced in the book contribute neither to the clarity of the discussion nor to the reputation of the discussant. However, these are niggling points that do not detract from the substantial value of this book which I am happy to have read and shall continue to find useful.

One additional point must be considered. This volume costs $24, a price that I consider completely out of line for a book of this size and type. If it is in fact true that it is not economically feasible to publish such a symposium volume for less than $24, then serious thought must be given to alternative methods of disseminating this information so that the many research workers and graduate students who could benefit from this material can reasonably obtain it.

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Molecular Biology

Nucleic acids play a central role in the interdiscipline that has come to be known as molecular biology. In recent years, owing to the numerous advances being made in this area, many books have been published, some at the "beginner's" level.

Such a book is **The Biological Role of the Nucleic Acids** (Elsevier, New York, 1966. 112 pp., $3.95) by David Cohen. It is a short work, slightly more than 100 pages; however, since Cohen has elected to write about all of molecular biology, this brevity is its principal weakness. In addition to this difficulty, he never resolves the problem of whether to direct the book toward scientist, student, or layman. As a consequence, the presentation often vacillates stylistically between the type of superficiality encountered in bad newspaper reportage and that which results from insufficient explanation of complicated phenomena. For example, when referring to the action of alkali on RNA, Cohen makes the following statement: "Thus RNA, because of the extra oxygen atom, literally falls to pieces when treated with even the mildest alkali." A few pages further along in the text there is a diagram that depicts in a highly sophisticated manner (that is, by electron displacement) the mechanism for the hydrolysis of RNA by alkali. This is explained in the following way: "The mechanism of this hydrolysis is expressed by the reaction sequence shown in Fig. 38, where the small arrows represent movement of pairs of electrons." No additional explanation is given.

Cohen is inconsistent in other ways. He states in the preface that readers will be warned of "any theories which are of a speculatory nature." However, in discussing the various properties of soluble RNA, this molecule is factually described existing "as a double helix but is looped back on itself so that it is really a single chain," a theory which was never supported by direct evidence and which has now been discarded.

Finally, the lack of references, with only a skimpy bibliography, is self-defeating if the book is to have any value for the scientist or student. Even the general reader would find a selected reading list extremely helpful, and such a list would enable him to maintain and extend any initial interest.

If Davidson's fine monograph *The Biochemistry of Nucleic Acids* is to be thought of as "a child's guide to the nucleic acids," Cohen's book can be considered at best its prenatal counterpart.

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Earth Science

If the reader is a confirmed granitizationist, he will doubtless find much that is comforting in E. Raguin's book, **Geology of Granite** [Interscience (Wiley), New York, 1965. 336 pp., $11], which has been translated from the second French edition by E. H. Kranck, P. R. Eakins, and Jean M. Eakins, for Raguin has followed in the footsteps of H. H. Read in that he believes that there are granites and

granites, but that most of them are of one kind—nonmagmatic. These are his words: "Of course a magmatic intrusion, formed either by differentiation of a basic magma or by ascent of a problematic granite magma would resolve the question for the most part. But we have seen how unlikely an intrusion is, in the immense majority of cases, and notably in all cases where the formation of granite in place, or nearly in place, is affirmed for the great part of its material or almost all of it" (p. 294).

Anyone who hopes to find a fresh approach to the "granite problem" will not find it here. It is surprising to read a book dealing with granite and find not a single chemical or modal analysis. No triangular diagrams depicting these data on the different types of granites are provided in the book. No use is made of the trace element distribution in granitic rocks. The mineralogy of the feldspars is treated superficially, with no attempt to distinguish various types on the basis of mineralogy. Experimental studies on systems related to granite are barely mentioned. No mention is made of Bowen's "petrogenys residua system" or of its significance in the generation of granite magmas through differentiation of more basic lavas or in anatexis. Many geologists will be astonished to learn that the Sierra Nevada batholith is a product of granitization as are the Tertiary granites of the Alps (p. 204). The gabbro-granophyre association is not considered.

Despite the lack of quantitative chemical and modal information, the book offers a wealth of information on the field relations of granite and related rock types.

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Plant, Soil, and Microbial Interactions

Microbiology and Soil Fertility (Oregon State University Press, Corvallis, 1965. 164 pp., $4.50), edited by C. M. Gilmour and O. N. Allen, contains seven chapters, each based on an address given at the 25th Annual Biology Colloquium held at the Oregon State University in April 1964. The chapters deal with various aspects of plant-soil-microbial interactions and are presumably directed towards the perplexing and enduring question concerning the role played by microorganisms in the phenomenon of soil fertility. Although specific organisms are known to carry out biochemical transformations resulting in products available to plants, and the population as a whole can be demonstrated to be an active fraction of the soil organic matter, the presence of which so greatly modifies soil properties, soil microbiologists have long been frustrated in their efforts to control fertility through manipulation of the soil population. Plants are but one of the organisms in the ecosystem, albeit the one that man considers most important. There is a tendency to regard the microbial population as being in some vague way subservient to the higher plant, whereas in fact a cropped soil is microbiologically greatly different from an uncropped soil because of the many effects produced by the presence of living roots.

It is somewhat invidious to select particular chapters for special comment, because a high standard is maintained throughout, but perhaps it is a reviewer's prerogative to dwell on topics of especial interest to him. C. D. Moodie approaches in a thoughtful way the nature of the sites of nutrient exchange and absorption in soils, and the effects of moisture level on soil as a microbial medium. C. C. Delwiche takes a broad biogeochemical view of the distribution and cycling of carbon and nitrogen in the biosphere, pointing out that the latter contains only one part in 10^7 of the carbon on the surface of the earth. Full characterization of the major part of this, which is soil humus, still defies the organic chemist, but as F. E. Broadbent points out, recent findings do permit recognition of certain functional groups and the conclusion that it is not "entirely a disorganized collection of biological residues."

Ethel K. Allen and O. N. Allen discuss the evidence for symbiosis of soil organisms with nonleguminous plants that have roots on which nodules or other root hypertrophies are observed. In a few instances, isotopic nitrogen studies have established significant fixation of nitrogen, but they make it clear that many species have not yet been critically examined and that where organisms have been isolated from such root tissues, adequate proof of reinfectiveness and nodule production has not been given. The Rhizobium-legume association is not well understood, but according to J. C. Burton, there is still potential improvement to be realized by further physiological and genetic investigations of strain variation and host specificity.

These seven papers constitute a valuable report on the current state of our knowledge of seven topics in soil microbiology and microbial-plant relationships.

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Cultural Anthropology

Marquesan Sexual Behavior (Harcourt, Brace, and World, New York, 1966. 251 pp., $5.95), by Robert C. Suggs, represents an attempt to obtain sufficient factual data to develop an adequate picture of present Marquesan sexuality, and to salvage enough of the vanishing information concerning aboriginal sexuality to permit comparison and a study of culture change. That his attempt was largely successful is a tribute to his and his wife's objectivity and understanding of Marquesan language and culture.

The islanders were not amenable to direct biographical interviewing on sexual matters—a curious reluctance in so permissive a culture—and one perhaps attributable to missionary influence and generalized distrust of Europeans. Therefore, the data collected by the Suggses was obtained by listening to (and sometime judiciously encouraging) conversations and by observation. Since Marquesans are much given to sexual talk and gossip, this monitoring of conversation proved an effective technique. Suggs cross-checked his male-derived data with that obtained from females by Mrs. Suggs.

Following an initial chapter devoted to physical environment, history of European contact, and a brief sketch of social organization, the author employs a life-cycle approach with consecutive chapters entitled "Reproduction," "Infancy and childhood," "Puberty and adolescence," and "Marriage and adulthood." In these chapters, which constitute the heart of the volume, the author first presents the modern and then the aboriginal data.

The next two chapters are devoted to art and religion. Although explicit