the title is misleading. Contrary to the rule, the proofreading has been very well done (I noted no typographical errors). Although I was disappointed to find considerable duplication of material (indeed, the same equation, the equation for the theoretical exhaust velocity in a rocket nozzle, is derived in two different chapters by two different authors), the editor has otherwise done a commendable job; the book appears to be remarkably free from half-truths or misstatements.

I particularly enjoyed E. Stiefel's treatment entitled "Many-body problems and interplanetary flight" and A. J. Sarnecki's "Dynamics of rigid body motion with especial application to the rotation and stabilization of satellites." Stiefel's treatment of the motion about a central body is quite lucid. Sarnecki spends some 27 pages laying the mathematical framework in tensor analysis on which to develop his thesis. Engineers will find this section of great value in assessing the utility of vectors and tensors as mathematical tools, as in rigid-body mechanics, or in brushing up on a long-neglected technique.

Inasmuch as his material is primarily descriptive, I found H. G. R. Robinson's discussion "The overall design concept of the E.L.D.O. 'Initial Programme' satellite launching vehicle" quite out of place in a book of this title. The chapter "Space vehicle stabilization," by W. G. Hughes, is very sketchy. His discussion of aerodynamic torque, to which he devotes an entire "section," consists of the enlightening statement that " . . . aerodynamic torques are likely to become comparable with gravity torques somewhere in the height range 100 km to 600 km."

R. H. Giese has contributed a chapter entitled "Fundamentals of satellite tracking and orbit determination"; M. J. Davies, "The planetary equations and atmospheric perturbations of a satellite orbit"; and W. M. Kaula, "Gravitational and other perturbations of a satellite orbit." These chapters appear to be uniformly good. D. S. Carton has wasted 10 pages in a discussion entitled "The propulsion and motion of rigid rocket-propelled launch vehicles" inasmuch as virtually all he has said is repeated in much greater detail by J. M. J. Kooy in "Dynamics of controlled rocket launching."

I recommend the book only to those willing to pay the full price for a fraction of the 313 pages.

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Foundations of Modern Chemistry

Nuclear Chemistry. Bernard G. Harvey. Prentice-Hall, Englewood Cliffs, N.J., 1965. viii + 120 pp. Illus. Paper, $1.95; cloth, $3.95.

With rare exception the chapter entitled "Nuclear chemistry" in freshman chemistry textbooks fails to reflect the research activities of present-day nuclear chemists. This is due to the fact that the theory of such research falls under the scope of nuclear physics and, frequently, only the experimental technique or the training of the investigators justifies the use of "chemistry." In this respect, nuclear chemistry is quite distinct from radiochemistry, which is the application of nuclear techniques to chemical problems. Harvey has written this book, one of the Foundations of Modern Chemistry Series, within this definition of nuclear chemistry. He describes his book as "a nonmathematical introduction to the rich variety of nuclear phenomena, intended especially for scientists outside of the field of nuclear physics" and, hopefully, with "appeal particularly to students of chemistry."

In the first five chapters he describes the general features of the nucleus, forces within nuclei, theories of nuclear structure, radioactive decay, and nuclear reactions and fission. Throughout, greater emphasis is placed on interpretation in terms of models than on nuclear phenomena per se. The final three chapters cover material found commonly in freshman chemistry texts—Radiation, matter, and counters; Particle accelerators and reactors; and Applications of nuclear science.

The competence and enthusiasm of the author are evident throughout this well-written book. Furthermore, he meets admirably the demands of selection, conciseness, and clarity imposed by the 120-page format. An average first-year chemistry student may have to struggle, but not unduly, with some sections—for example, the discussion of angular momentum. Although additional reference books are cited at the end of the book, a specific bibliography placed at the end of each chapter might have been more helpful.

It was a pleasure to read this book, and I recommend it as a fine introduction to the major topics of interest to nuclear chemists.

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Virology

Viruses, Cells, and Hosts. An introduction to virology. M. Michael Siegel and Ann R. Beasley. Holt, Rinehart, and Winston, New York, 1965. 175 pp. Illus. Paper, $1.96.

This small book has many features that recommend it for the general reader and as a supplement to a general biology textbook for students interested in virology. It covers the most important and active areas of the subject and takes pains to explain the techniques and manipulations that the virologist uses in making his observations. Hence, it gives the reader a better understanding of the subject than the usual type of popularization in which exciting results are cited without operational details. Successive chapters deal with the structure and organizations of cells, the structure of virus particles, the methodology of virus research, the virus-cell interactions, and the production of malignancy by viruses. In the first part the style and presentation are quite elementary, and occasionally even sloppy; the writing becomes more technical and frequently obscure in later chapters, where the authors are dealing with subjects closer to their professional interest.

The value of some of the background material included is questionable. A reader unfamiliar with the elements of cellular biochemistry given in chapter 2, or with those of atomic structure outlined in chapter 4, would hardly find a book on viruses understandable, even with these brief explanations.

Some major mistakes have been allowed to slip in, as in an illustration of the duplication of DNA, which lists the "free nucleotides" as precursors. Also, one notices some evidence of imprecise thinking or writing, for example, "Proteins give the cell body

and substance" or "[Viruses are] . . . attracted to a cell." These shortcomings, however disturbing they may be to the critical reader, do not seriously affect the value of this little book designed to introduce the beginning biology student to an active and exciting area of science.

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Fundamentals of Botany Series

Plants and the Ecosystem. W. D. Billings. Wadsworth, Belmont, Calif., 1964. vi + 154 pp. Illus. Paper, $2.35.

Lack of appropriate text material has limited the effectiveness with which ecology is usually treated in introductory courses in biology and botany. In recent years several soft-bound textbooks of modest length have been published to meet this need, and one of the most skilfully prepared of these is *Plants and the Ecosystem.*

At the outset the subject matter and aims of ecology are described with respect to the individual organism, the population, and the ecosystem. Environment is discussed under the usual categories of physical and biological factors but in terms of energy flow, biogeochemical cycles, and integration of plant-environment relations so that the coherence of ecosystems is made clear. Physiological ecology is specifically treated in a brief chapter constructed on the topics of germination, vegetative growth, and flowering and fruiting. A discussion of the geographic distribution of plants, which provides a capsule survey of distribution patterns and ecotypic variation, precedes a sketch of North American Cenozoic vegetation history in light of paleoecological interpretations. A short but effective chapter on structure and classification of plant communities leads into a chapter on ecosystem dynamics where various facts and concepts presented in previous chapters are shown to have significant interrelationships. One of the longest chapters is a survey of "terrestrial ecosystem types" (which a few years ago might have been termed more simply "climax formations" or "biomes"); this chapter, which is documented by citations of representative areas and characteristic genera in all parts of the world, provides a sound and well-balanced presentation. The concluding chapter, "Ecology and man's welfare," reviews applications of autecology, population ecology, and ecosystem ecology to human health and environments, treating briefly intriguing problems such as those of the "giant city ecosystem" and synthetic ecosystems as well as the "modified ecosystems" increasingly shaped by our management practices.

The terms and statements of this book are handled so that the average student in an elementary college course in biology can readily understand them, yet the subject matter is so rich in examples from contemporary research and so clearly presented that advanced students will find the book a useful review of general plant ecology. Inevitably, limited space has led to oversimplification of some explanations of functions and relationships and in places to logic that will disturb the critical reader (for example, relating the distant sun to plant environment equally with a phosphate ion in the soil because light can travel from the sun to the leaves before the ion can ascend the stem). Two pages of suggestions for further reading offer an extremely diverse list of books and articles, but it is the kind of mixed bag likely to entice the reader new to ecology into exploring further different facets of the broad subject. A 4-page glossary duplicates many definitions that are given in the text and condenses some so that they are of little use. The 2-page subject index has fewer entries than the wealth of subject matter in the text would seem to warrant. These criticisms, however, are minor in view of the volume's quality and usefulness. This small book conveys a remarkable amount of well-chosen information on plant ecology in a style that stimulates the reader's interest and is likely to fix the statements in his mind.

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Social Stratification

Stratification in Grenada. M. G. Smith. University of California Press, Berkeley, 1965. xiv + 271 pp. Illus. $6.

The object of this study of one of the Windward Islands is "to describe the conditions of status distribution among Grenadian elite; to illustrate a method for the field study and analysis of social stratification that seems especially appropriate to small societies or to small segments of large societies; and finally, to test the theories of action and pluralism by analyzing stratification among the Grenadian elite" (p. 228). The first two aims are achieved at a high level of professional competence. Taken in conjunction with other of the author's books [*West Indian Family Structure* (1962), *Kinship and Community in Carriacou* (1963), and *The Plural Society in the British West Indies* (1965)], this work comes close to making Grenada's one of the best described stratification systems since the publication of W. L. Warner's *Yankee City*. The method followed also has much in common with Warner's, although it is pursued with greater rigor and completeness, and the analysis is presented with a modern technical sophistication understandably missing from Warner's pioneer work.

Smith's third object is to test theoretical assumptions that lie close to the heart of contemporary social science, and his endeavor may be considered a part of the trend toward the revision of neo-functionalist theory which is underway in American, British, and French sociology and anthropology. It is an interesting, rare, brave, and, in my opinion, unsuccessful attempt.

Smith's test of theory is developed through juxtaposition of Furnivall's concept of *plural society* (implying fundamental value differences among segments) with Parsons' *theory of action* (implying fundamental value similarities among segments, even in loosely integrated systems). Smith carefully documents that there are very fundamental value differences in the bases of social stratification for different segments of the elite in the British West Indies, and concludes that this is a pluralistic society. Because some of the values in question are precisely those attributed universality by Parsons, Smith feels that he has demonstrated the inapplicability of "action" theory to Grenada. This would certainly be a finding of the greatest importance.

The demonstration is not compelling. Smith's own method, which combines the status judgments of persons of different strata to provide an index of the overall status of particular individuals, surely presupposes some common elements of evaluation—otherwise the combined index is artifactual and meaningless for his purpose. The demonstration of difference does not negate