

which the characters of the genus are noted. Other drawings give the technical terms that are used in the diagnosis of shells. The keys and the explanatory notes of their use take up 81 pages. Following this there is a systematic list which gives a classification of the groups down to genera. Under a section entitled "Ecology," the genera are arranged alphabetically, and the approximate number of species in each genus, its range, and its habitat is briefly noted. The glossary contains most of the technical terms used in discussing molluscan shells but not anatomy. There is a short bibliography and an excellent index of scientific names.

The difficulties encountered in constructing a key to so large a group as the Gastropoda are almost insuperable; only the brave would attempt it, and only the most tenacious would complete the task. This is especially true with respect to those genera that have a multiplicity of subdivisions which are based upon more or less trivial characters. The author undoubtedly encountered many cases where a choice of diagnostic characters of the shells was difficult. By bringing the nomenclature up to date and furnishing adequate illustrations, together with distinguishing characters of each genus, Myra Keen has provided a unique handbook that will long remain the standard reference for the area. Professional conchologists, individuals engaged in commercial shell fish investigations, and amateurs alike will find it indispensable.

It is the first book of its kind for the area concerned, and it covers all of the shell-bearing mollusks. It may well serve as a model for handbooks covering other areas.

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Range Lands

Range Ecology. Robert R. Humphrey. Ronald, New York, 1962. v + 234 pp. Illus. \$6.50.

Range Ecology, a welcome addition to the literature, is the first book devoted to this subject. However, its title belies its contents; if the treatment of physiological effects was more complete, "Factors Affecting Plant Growth" would be a more appropriate title. The book is divided into 11 chapters, of

which the first nine are on factors that affect plant growth—climate, atmosphere, temperature, light, soil, soil water, physiography, biotic influences, and fire. The remaining chapters are on range condition and the "range unit as an ecosystem." The book, which developed as a result of Humphrey's teaching experience, is somewhat contradictory in that it is written largely in non-technical language but presupposes a background of plant ecology. For example, the terms *autecology*, *synecology*, *primary succession*, and *secondary succession* are presented without definition.

The chapters on soil, soil moisture, and fire are especially well done. The author concisely appraises the current status of our knowledge about these subjects, including the worth of range fertilization and prescribed burning. But his treatment of light is somewhat inadequate, for he implies that light is important only in forested areas used for rangeland. In the chapter on biotic influences, the response of range plants and plant communities to livestock grazing is given particularly inadequate treatment, but the effects of game are carefully reviewed.

In the chapter on range condition the various approaches used by federal agencies in classifying range conditions are objectively analyzed. Humphrey is critical of the climax approach used by the Soil Conservation Service, but he fails to recognize that the guides are closely coordinated with the potential of the site. He is also critical, perhaps overly so, of the three-step method used by the Forest Service and the two-phase method used by the Bureau of Land Management for determining range condition and trend. Some of his criticism is valid—the standards now used for classifying condition are inadequate and the natural differences in the vegetation on northern and southern exposures should be recognized. But he unfairly belabors the lack of randomization of transects and plots in the usual application of the method and fails to recognize that these selected sites are intended merely as bench marks for use in judging similar areas of vegetation and conditions. The method specifically provides, in cases where a high level of sample accuracy is required, that transect locations must be randomized. Few can argue with the requirements that Humphrey outlines for a usable approach to classifying range condition.

The final chapter, "The range unit

as an ecosystem," is pitifully short (4 pages). It should have preceded the one on range condition, and in that case, the chapter would have served as essential background for that subject as well as a vehicle for intensive consideration of plant communities, plant succession, and range indicators. Despite the author's statement that "the exclusion of certain contributions does not reflect on their value," it seems strange that he has excluded reference to outstanding works such as those of A. W. Sampson (other than his text), M. W. Talbot, Lincoln Ellison, David F. Costello, and H. C. Hanson. One standard text on range management—by Stoddart and Smith—is entirely overlooked.

Despite these and other shortcomings, the book is a good addition to the literature and should be of value to beginning students, ranchers, and those responsible for administration of the range. Perhaps, too, it will inspire others to write in this somewhat neglected field.

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Ecology

Advances in Ecological Research. vol. 1. J. B. Cragg, Ed. Academic Press, New York, 1962. xii + 203 pp. Illus. \$7.50.

Ecology deals with the many relations of organisms to their physical and biotic environments, and, as it has developed, it has separated into many more or less distinct fields of research. This new series, *Advances in Ecological Research*, recognizes the need for some form of integration of the rapidly diverging disciplines by presenting comprehensive articles on selected topics so that both the general reader and the specialist may obtain a balanced interpretation of current research and concepts in animal and plant ecology.

The first volume contains four contributions, each dealing with a different aspect of ecological research. The first, "Soil arthropod sampling," by A. Macfadyen, presents a practical summary of methods used for sampling soil arthropod populations; some topics considered are the methods used in three main types of work—exploratory, community, and trophic studies, the problems

associated with patchy distribution, and a survey of the main types of collection and extraction processes. The second, "Successive approximation in descriptive ecology," by M. E. D. Poore, deals with the description and classification of plant communities; by using critical observation coupled with data that have been classified, correlations can be discovered and hypothesis formed; these can then be checked and rechecked for consistency by further observation. The third, "Energy in animal ecology," by L. B. Slobodkin, discusses the relevance of energy to ecology, the theory of energy budgets, entropy and information in ecology, Lindeman's theoretical formulation, the laboratory study of *Daphnia* energetics, and some field studies of efficiency. The fourth, "Quantitative ecology and the woodland ecosystem concept," by J. D. Ovington, deals with the dynamics of organic matter and energy and the circulation of water and chemical elements in forest communities. There are subject and author indexes.

The four articles are a very good beginning to this new series, for they indicate the complexity of the problems that face ecologists and the precision with which limited aspects of these problems can be investigated. One hopes, however, that in future volumes some articles will place the detailed studies in perspective so that the significance of many of the interactions occurring in nature can be assessed.

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Gleason's Flora Abridged

Manual of Vascular Plants of Northeastern United States and Adjacent Canada. Henry A. Gleason and Arthur Cronquist. Van Nostrand, Princeton, N.J., 1963. lii + 810 pp. \$11.75.

A new manual covering all the vascular plants of the northeastern United States and adjacent Canada will be considered a major publishing event by a multitude of botanists, students, and naturalists, both amateur and professional. The 8th edition of *Gray's Manual* (1950) is the only other such manual to appear in the past 55 years, a period which has seen not only a vast

amount of field work in the region but also increasingly profound studies and improvements in taxonomy and nomenclature.

The present manual is not actually all new, for it is a compression of the large three-volume *Illustrated Flora* (1952), which covered essentially the same area and 4600 species, by Gleason and collaborators. Chief among the latter was Cronquist, who contributed the Compositae, and who now points out in the preface that insofar as this manual differs from the *Illustrated Flora* it is his work. (The joint authorship on the title page is chronological, not contemporaneous.)

Condensation of the large flora into a book smaller than *Gray's Manual* (though printed on more substantial paper) has been made possible by the use of small print (especially in the keys), a slight shortening of some keys and descriptions, the complete absence of illustrations, and the omission of any explanatory introduction except for a glossary. This omission will not be serious in the classroom, where a teacher and appropriate text can guide the student through the elements of systematic botany. But interested laymen and nonbotanists may wish for an explanation of the nature of taxonomy and taxonomic categories, of scientific names and their authors, of the methods and techniques used in identifying plants and interpreting the manual, and of the proper way to prepare specimens.

Because the keys are essentially those of the previous flora, one may predict that they will maintain an enviable reputation for leading to the correct answer with a higher average frequency than those of the other contemporary manuals. Except for the General Keys (to families, exceptional genera, and the like), the keys have been improved by making them strictly dichotomous, and their overall construction reveals a crispness and attention to parallelism which are too often lacking in *Gray's Manual* (but which, it must be admitted, are sometimes also lacking in nature).

The only major taxonomic innovation is the reduction of *Crataegus* to 21 species, more or less comparable to those recognized in *Rubus* (no longer even called "collective species"). Numerous lesser changes in taxonomy and nomenclature are made, and some species are added. But other range extensions and revisionary work of the past

decade are not utilized. To what extent these have been intentionally rejected rather than merely ignored is unknown; the net result is an impression of a commendable but spotty effort to be up to date.

The book has usefully flexible covers, a binding that is already separating on my review copy, and rather frequent typographical errors.

The conservative taxonomic treatment, mention of few varieties, clarity of the keys, handy format, and fair price (if maintained) should give this volume the wide appeal that a work of its magnitude deserves.

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Basic and Applied Biology

Temperature. Its measurement and control in science and industry. Charles M. Herzfeld, Editor-in-Chief, vol. 3, pt. 3, *Biology and Medicine*. James D. Hardy, Ed. Reinhold, New York; Chapman and Hall, London, 1963. xii + 683 pp. Illus. \$22.50.

The science and technology of temperature measurement and control have been the subject of several volumes in a series of symposium proceedings of which this is the latest; with this volume the series is extended, for the second time, to include biology and medicine. This inclusion has introduced an interesting point in semantics; the control of temperature in living systems is often provided by the systems themselves, and the mechanisms by which the control is accomplished, especially in man, constitute a major problem for both the basic and the applied biologist.

In the fields of military and industrial hygiene and in the field of medicine, it is often difficult to provide simultaneous coverage of both the scientific aspects and their applications. It is, therefore, a pleasure to encounter a collection of papers as carefully prepared and assembled as those found in this volume. There are 56 papers by 70 authors and, as befits the nature of the subject, half of the papers are, at least in part, from government laboratories, including a few from laboratories in the British Commonwealth. The material covered includes temperature measurement and calorimetry, temperature effects in living systems, tissue