

the recovery of waste products could be saved, leaving more time and energy for devotion to constructive and creative work in science, art and letters.

A word of praise is due to the translators for having produced a good, readable version of the original which, if it conforms to type, bears the imprint of what Schopenhauer called the essentially German characteristic—ponderosity.

E. H. TRIPP.

## A PACIFIC SEAWEED FLORA

Marine Algæ of the Monterey Peninsula, California

By Prof. Gilbert M. Smith. Pp. ix+622 (98 plates). (Stanford University, Calif.: Stanford University Press; London: Oxford University Press, 1944.) 36s. net.

IN most maritime countries there are certain stretches of the coast-line that offer peculiarly favourable conditions for the study of marine life. Such a one is the Monterey Peninsula in California, which is noted not only for the wealth and diversity of its seaweeds, but as the domicile of the Hopkins Marine Station from which, since its establishment in 1892, many important contributions to our knowledge of the marine life of the Pacific have issued. Among these must be ranked the work which forms the subject of the present review. All botanists who have had or may have the good fortune to visit this privileged region will owe a debt of gratitude to the author for giving them the benefit of his prolonged experience of its seaweed population. Smith's valuable book, which deals with the green, brown and red Algæ of the Monterey Peninsula, is, however, far more than a local flora, since approximately three-quarters of the seaweeds recorded from the Pacific coast of North America occur on the shores of the Peninsula. Moreover, it constitutes the first recent taxonomic account of the American Pacific Rhodophyceæ, since the section dealing with this class in Setchell and Gardner's "Marine Algæ of the Pacific" was never published.

The brief introduction contains a useful section on the distribution of the seaweeds on the shores of the Peninsula, which might with advantage have been fuller. The numerous keys for the determination of families, genera and species are supplemented at the end of the book by comprehensive keys based almost entirely on external form and vegetative structure and designed to facilitate the ready recognition of the genera. The classification follows familiar lines; the Chlorophyceæ are grouped according to the scheme adopted by the author in his other books, while the Phæophyceæ and Rhodophyceæ are arranged on the general lines proposed by Kylin. As I have pointed out elsewhere, I am doubtful as to the value of the grouping of Phæophyceæ under Isogeneratæ and Heterogeneratæ, since in my opinion it obscures relationships. Smith is logical in including among the Ectocarpales (*sens. limit.*), in the Isogeneratæ, the genus *Heterochordaria*, which probably has an isomorphic life-cycle, but its inclusion here removes it from similarly organized forms comprised in the Chordariales, with which it is justifiable to assume some degree of relationship. The author also adopts a new basis of delimitation between the genera *Acrochaetium* and *Rhodochorton*, referring to the latter all those species of *Acrochaetium* in which tetrasporangia are known to occur. This will scarcely find favour with most algal workers; it might be more

appropriate to adopt Drew's suggestion of grouping all the species in one single genus *Rhodochorton*.

The designations macrospores and microspores, applied to the eggs and sperms of Fucales, rest on so speculative a basis that they appear out of place in a work of this kind. In general, however, the diagnoses, incorporating a considerable number of new observations of the author's, are distinguished by their clarity and their ample character. This feature, combined with the copious and excellent illustrations (many of them the work of Mrs. C. F. Janisch) and the general finish of the book, contribute to make this one of the most noteworthy taxonomic works on Algæ published during the present century.

F. E. FRITSCH.

## FUNDAMENTALS OF RADIO PHYSICS

Physics and Radio

By M. Nelkon. Pp. viii+388. (London: Edward Arnold and Co., 1944.) 8s. 6d. net.

THE extensive application of radio technique during the past few years has given rise to a need for books on the general basic principles of radio physics. The book under notice goes part way to fulfil this need, and as the author states in the preface, the book should be useful to radio mechanics, wireless operators and students of School Certificate standard requiring a knowledge of the elements of radio.

The first fifteen chapters deal with the fundamental physical principles of electricity and magnetism. Six chapters are then devoted to considerations of the basic properties of valves and their use in various circuits for rectification, amplification and oscillation; these various functions should readily be understood in principle from the treatment given. In a chapter devoted to aerials, the subject is made clearer by several useful analogies with acoustical phenomena. Next follows an account of the fundamental ideas underlying the superposition of intelligence on the carrier wave at the transmitter and its subsequent separation from the carrier at the receiver. Chapter 24 gives first an outline of several phenomena observed in the study of light including reflexion and refraction from the point of view of wave theory; polarization and the differences between longitudinal and transverse waves are also discussed. This outline is intended to serve as an introduction to the behaviour of radio waves in the ionosphere, and suffers somewhat from its brevity; but the treatment given serves to explain skip distance and fading effects. The last of the twenty-five chapters describes a commercial cathode ray oscillograph, and the development of time bases for use therewith. Each chapter ends with a concise summary of the salient points and with a good selection of exercises to be worked out by the reader.

The book is very well written, is liberally illustrated and is eminently suited to the class of reader for which the author intended it. It may even have a wider appeal, for it involves only the most rudimentary knowledge of mathematics, and the calculus is avoided entirely. A very good feature is the inclusion of numerous practical examples which are worked out in the text, so that the student may realize the numerical significance of the various formulæ and properties of circuits.