added much detailed knowledge about nodule structure.

The author's background gives him particular competence with the nonleguminous plants and the blue-green algae. In chapter 3, the groups of nonleguminous plants which fix nitrogen are cataloged. Because the endophytes in these root nodules have been resistant to cultivation free from the host, information about them is indirect. However, the structure of nodules, their formation, and the site of fixation are covered very effectively.

In a chapter on the physiology of symbiotic nitrogen fixation, Stewart has chosen to discuss the carbohydrate-nitrogen ratio, the transfer of fixed nitrogen in the plant, the physical and nutritional factors influencing fixation, and the effect of gases.

The treatment of nitrogen fixation in free-living organisms is divided into chapters on blue-green algae, bacteria, and the physiology of the process. These chapters include helpful compilations on the species of blue-green algae and the groups of bacteria that have been reported to fix nitrogen. The interaction of blue-green algae with other organisms presents a number of interesting biological associations. Each group of nitrogen-fixing bacteria is discussed briefly in an attempt to put them in perspective. In chapter 6 Stewart also lists the organisms that have yielded active cell-free preparations and discusses the requirements of these preparations for nitrogen fixation.

Chapter 8 deals with the biochemistry of nitrogen fixation. The author perhaps takes the oxidative pathway of nitrogen fixation too seriously. The discussion of current concepts of the mechanism of nitrogen fixation is good.

The final chapter is concerned with nitrogen fixation in the field, and the difficulties in obtaining quantitative results are properly stressed. The best data available are organized in assessing the practical importance of the various nitrogen fixers.

The list of references is excellent, and only a few that are of real importance to development of the broad picture have been omitted. The index is comprehensive and well arranged. The format of the book is attractive and the price is modest.

The author accepts a number of points from the literature which I question seriously. Although these may reflect legitimate differences of opinion, it appears often that the data at issue really are questionable and should be labeled as such. Despite some lack of critical evaluation in the text, Stewart is to be congratulated on writing a clear, readable, and very helpful book on nitrogen fixation.

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Marine Biology

In **Meeresbiologie: Eine Einführung in die Probleme und Ergebnisse** (Borntraeger, Berlin, 1965. 434 pp., DM. 88), Hermann Friedrich surveys the scientific problems, goals, and results of marine biology, primarily for students and nonprofessional marine biologists; however, his book will also be useful to scientists familiar with the sea. The well-organized text treats the development of marine biology, methods, and abiotic and biotic ecological factors (98 pp.); animals and plants of the pelagic realm (76 pp.) and of the benthos (95 pp.); the distribution of organisms in space and time (83 pp.); inhabitants of the marginal zones of the sea, including brackish water (18 pp.); and economic aspects (9 pp.). Since sufficient introductory information is presented, the reader need not resort to other texts on the ocean. There are 220 figures, a moderately extensive index, and almost 800 references.

The book stresses the ecology of species; the physiology of marine organisms is not considered to any extent. Emphasis is placed on the animals; bacteria are merely mentioned. The chapter on the benthos seems to be stronger than that on the plankton. Both chapters deal intensively with form and functions ("Lebensformtypen," like feeding and locomotory types) and with reproductive biology. There are a great many suggestions for further investigations, although many of the phenomena are not accessible to experimentation. I wish the author had provided more detail in some places rather than referring to the literature. The slightly speculative treatment of evolutionary aspects might be taken as a challenge.

More is said on autoecology than on synecology because more information is available on the former. Although problems of the biological classification of the marine environment are not stressed, a better integration of the terminology would have been helpful. Use of the term "biocoenosis," with its implications of close biological relationships between the species of the associations, although explained, is avoided. Marine production is discussed in the chapter on distribution. This is essentially a consideration of standing stock; the treatment of processes and rates is not fully up-to-date.

A few literature quotations in the text are handled inconsistently. The figures are clear throughout, but the captions to some figures and tables are deficient or are not even given. Also, inconsistencies in the choice of dimensions used in the text and figures, and in labeling the figures (sometimes in English), could be remedied easily in a new edition or translation.

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Aspects of Biophysics

What does biophysics mean? A definition is not as illuminating as an inspection of what biophysicists are actually doing. I recommend **Molecular Biophysics** (Academic Press, New York, 1965. 462 pp., $19.50), edited by Bernard Pullman and Mitchel Weissbluth, to the nonbiophysicist who is curious about the nature of the field and to the biophysicist himself who could scarcely know all the subjects that are discussed in this book.

Molecular Biophysics is a collection of 15 essays—written by a biologist, a physicist, a biochemist, an applied mathematician, a biophysicist, and eight physical chemists—on a wide variety of topics, ranging from valence theory and radiofrequency spectroscopy through nucleic acid structure and function to muscle contraction. The papers were presented at an international summer school sponsored by the North Atlantic Treaty Organization and the Office of Naval Research and held at Squaw Valley, California, in August 1964. Some of the contributions are elementary, others rather sophisticated. Some authors deal directly with biological problems; others treat problems that are only tangentially involved in biology. The individual contributions are almost all of a very high order, although again some present new material and others are general reviews of classic subjects.