and is a classic not only from the point of view of content but also because of the clarity with which the subjects are presented. The seventh paper, "Atomic Hydrogen as an Aid to Industrial Research," is far more than the title promises, and gives an insight into the psychology of discovery and the importance of basic research in industry.

A large number of the essays are devoted to the arrangement of molecules, their distribution and orientation, and the connection between the structure of liquids and surface tension, the phase of Langmuir's work that is so famous. There are also his investigations on atomic hydrogen and the question of chemical forces, valency, and structure.

One wishes that every student of physics or chemistry could study these papers carefully, and it is regrettable that the price of the volume is so high. If a reprint of the first four essays and the seventh could be published as a small pocket book it could be used with profit by students of science and science education. There is a complete bibliography with more than 200 titles, offering an amazing outline of the various activities of the author in a large number of fields of physics and chemistry.

KARL LARK-HOROVITZ

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The Sea and Its Mysteries: An Introduction to the Science of the Sea. John S. Colman. London: G. Bell and Sons; New York: British Book Centre, 1950. 285 pp. 12s. 6d. net.

This very readable book covering the broader aspects of oceanography is a welcome addition to the literature, particularly for those wishing a general picture of marine life, of waves and currents, and of the chemistry of sea water. The illustrations are clear and well chosen. There is a delightful account of the Great Barrier Reef of Australia, which will appeal to scientist and layman alike.

The authoritative chapters on "Animal Plankton" and "Life in the Depths" are very interesting reading. Only minor criticisms can be offered. Some people may object to the overemphasis of the Atlantic and the inadequate treatment of the Pacific. The chapter on "The Shape of the Sea" is comparatively accurate but disappointingly short; it gives very little of the recent American investigations. The "Short List of Reading Matter on the Sea" at the end of the book could have been somewhat lengthened to supply the needs of readers who develop a wide interest in oceanography.

Understandable errors regarding the character of tsunamis (tidal waves) may be found in the book. These waves are erroneously attributed to earthquakes rather than to the movements that cause or accompany the earthquakes, and the "much faster" movement of tsunamis than wind waves in shallow water is erroneous, as many of us who experienced these waves in Hawaii can testify. The continental slope is said to have a "ruling gradient between 1 in 17 and 1 in 30," but a world-wide study indicates that the average is 1 in 14. One imagines that Colman's figures came largely from the Atlantic, although even there greater average declivities are found. One of the best features of the book is the clear indication throughout that the author knows the sea from firsthand experience. This is particularly apparent in the last chapter, with its stimulating account of many of the natural phenomena likely to be encountered on a sea voyage.

FRANCIS P. SHEPARD

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Plant Pathology. Sir Edwin J. Butler and S. G. Jones. London-New York: Macmillan, 1949. 979 pp. $10.00.

The first part of this book, on "General Principles," includes discussions on the structure, growth, life histories, dissemination, and variation in fungi; host-parasite relationships; influence of environment on disease; resistance and susceptibility; virus diseases; and deficiency diseases. Most of these topics are presented thoroughly, yet clearly and simply. The discussions appear to be based on extensive firsthand knowledge of a large number of fungi and diseases, as well as critical evaluation of world-wide literature on the subjects. Chapter 2, which includes discussions on persistence of parasites from year to year, heteroecism, specialization of parasitism, saltation, nutritional stimulation of parasites, and epidemics, is perhaps rather weak. Significant literature published in some of these fields in the last 20 years is not cited (only 35 references are cited for the entire chapter, permitting only sketchy coverage of most subjects). Some of the basic and practical principles established in plant pathology as a result of researches in these fields during the last 20 years are not mentioned.

The section on principles is followed by a nine-page synopsis of the classification of fungi that admirably summarizes the distinguishing characteristics of classes, subclasses, and principal orders and families of fungi. Under each family the genera most important in plant pathology are listed.

Section 2 includes summaries of selected diseases of the major groups of crop plants—cereals, forage and pasture crops, potatoes and root crops, pulses (peas and beans), vegetables, fruits, ornamentals, and forest and shade trees. Under each crop there are one or more examples of diseases caused by the major groups of organisms known to be of pathologic importance on that host. The general types of diseases to which the major crop plants throughout the world are subject are well covered. Discussions of the individual diseases are clear, thorough, and well documented by literature citations, both to specific research papers and general reviews.

There are 435 illustrations, most of them excellent, some of them outstanding. Many are original; few have ever appeared previously in any text. Most of the specific diseases discussed have good illustrations of symptoms, the fungus, and pathologic histology.

Literature citations follow each discussion of general principles and each individual disease or crop. The citations are arranged alphabetically, an advantage for the reader. However, only in a very few instances are titles or page numbers of papers cited; thus the reader cannot