COLLOIDAL PHENOMENA AND CLASSICAL THEORY

Colloid Chemistry. By ARTHUR W. THOMAS. McGraw-Hill Book Company, Inc., pp. 1–512, $4.00, 1934.

APPLICATIONS of classical chemical theory to the phenomena of colloidal chemistry have become increasingly numerous and successful in recent years. Professor Thomas has adopted this point of view in his "Colloid Chemistry" with marked success. The more important phenomena have been discussed in detail with complete references to the literature, but the book does not attempt to cover the entire field. "Clouds and Smokes," "Brownian Movement," "Liquid Dispersed Systems," "The Nature of Micelles" are thoroughly discussed and interpreted from the point of view of classical chemistry. Protein and carbohydrate colloids are discussed separately and Loeb's theory of the behavior of protein solutions is accepted in general. There are shorter discussions of precipitation by electrolytes, surface phenomena, absorption, foams, emulsions, gels and jellies, and also chapters on the experimental methods, such as dialysis and ultra-filtration and the preparation of colloidal solutions.

In the reviewer's opinion the experimental part is relatively too detailed, while some of the subjects, such as gels and jellies, could be expanded to advantage. The biological phenomena, such as agglutination of bacteria, the precipitin reaction and enzyme reactions are not discussed. On the whole the book furnishes a very clear introduction to the theory of colloidal reactions.

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THE PRACTICAL APPLICATIONS OF ACOUSTICS

Applied Acoustics. By OLSON AND MASSA. P. Blakiston's Son and Company. Pp. 430 + xiv, 1934.

ACOUSTICS, as one of the classical divisions of physics, has been a field of investigation for many distinguished philosophers and scientists from ancient times. The great mass of our present knowledge of the subject in its more purely scientific aspects is contained in the classical works of v. Helmholtz and Lord Rayleigh, but through the development of new instrumental means of investigation and the coordinate development and invention of other scientific apparatus during the past few decades, greater progress has been made in experimental acoustics, and in its application to our daily life, than in all previous times. This development was also facilitated through the general recognition of the close relationship between the problems of acoustics and of electrical circuits.

A number of excellent treatises have been published in the last few years which have presented these modern developments from different points of view. The book under review deals with the subject, especially with reference to its modern applications. The authors, as physicists in the laboratories of one of our larger industrial organizations interested particularly in the manufacture of acoustical equipment, have themselves made a number of notable contributions. They are therefore well qualified to give up-to-date information on the present status and trend.

The greater portion of the book is devoted to a description of the characteristics of the more important types of modern electro-acoustic transducers, such as microphones, receivers and loud speakers, and of methods for determining their performance. Emphasis is laid particularly on such instruments as have found application in radio broadcasting and talking pictures. The illustrations for these are taken mainly from the laboratories or manufacturing department of the organization with which the authors are connected.

The book limits itself to those instruments and methods which will be found useful in a modern acoustical engineering laboratory. No mention is therefore made of acoustical research methods which may have considerable historic interest but little use to-day. A chapter each is devoted to architectural acoustics and noise measurements.

The discussion within the descriptive part of the book, while entirely sound, is in a form that may be easily followed by any one familiar with the elements of mechanics and of alternating current theory. For those wishing to obtain a more thorough understanding of the principles underlying applied acoustics several chapters at the beginning of the book are devoted to fundamental classical and modern acoustical theory. For the reading of these a somewhat wider mathematical knowledge is required.

The book should be helpful to students who wish to familiarize themselves with the latest developments in applied acoustics, as well as to research workers of acoustical laboratories.

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A MANUAL OF THE RUSTS

Manual of the Rusts in United States and Canada. By JOSEPH CHARLES ARTHUR. Purdue Research Foundation, Lafayette, Indiana, pp. xv + 438, with 487 figs., 1934.

THE plant rusts with their complicated life-histories conditioned by variable spore-forms, strict parasitism and heteroecism have always been a difficult group taxonomically. The earlier and most of the later investigations have been analytic. We have