VI. The last two chapters deal with the physiological aspects and some more general applications of solubilization. Appendix I gives a concise theory of light scattering, and Appendix II discusses briefly the behavior of polysoaps.

There are relatively few shortcomings in this book. It is somewhat surprising that no mention is made of potentiometric studies of colloidal electrolytes, although such data provide valuable information on the properties of colloidal electrolytes. The section dealing with emulsion polymerization (p. 129) is disappointing and very weak; no mention is made of the important theory proposed by Ewart and Smith in 1948.

Fittingly the book is dedicated to the late James W. McBain, the pioneer in the field of solubilization, who has contributed so much to its development. Some statements made by him are reproduced in the introduction.

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Bibliography on Hearing. S. S. Stevens, J. G. C. Loring, D. Cohen, compilers. Harvard University Press, Cambridge, Mass., 1955. 599 pp. $7.

This bibliography is an enlargement of an earlier one, *A Bibliography in Audition,* by G. A. Miller, R. Galambos, W. A. Rosenblith, and I. J. Hirsch. It contains more than 10,000 titles listed alphabetically by author and includes a scheme of subject classification.

The procedures used in the compilation are not specifically outlined in the preface, nor is there a listing of the particular fields intended to be covered, although it is mentioned that, in comparison with the former edition, this one places added emphasis upon deafness, ultrasonics, the effects of drugs on hearing, information theory, and the psychological and acoustical effects of music.

A necessarily sketchy examination of the titles themselves indicates that there is extensive coverage of general and theoretical aspects of hearing, of the phenomena of pitch, fatigue, and masking, and of the special fields of speech and music. There appears to be somewhat limited coverage of historical material, of the anatomy of the ear, of hearing in animals, and of problems of deafness. Other topics, such as the physics of sound, the effects of noise, auditory testing, and the phenomena of beats, combination tones, and sound localization, seem to have an intermediate status, with a fair degree of coverage.

The subject classification, which is at the back of the book, consists of a division of the field into 315 topics and then under each of these a listing of the names of the authors whose relevant works are included in the bibliography. A person interested in a particular topic will look up the listed names and, when several articles appear under one name, must discover for himself which ones are concerned with his topic. This system is serviceable, despite its indefiniteness, but doubtless will evoke certain expressions of annoyance from its users.

It is made clear in the preface that the titles were assembled largely from secondary sources, and the usual errors from such a procedure are to be expected. I noticed only a few errors, mostly of a minor nature. Somewhat surprising is the listing "Tyndall, J. *Der Schall*" and the omission of this famous book in its original English. Errors noticed in the subject classification are of two sorts: some names listed are not to be found in the bibliography, and others are inappropriate. An amusing instance of the latter sort is the reference to articles by Cooseman on "Hearing in beetlers" under the topic "Animal studies; frequency range: invertebrates"; for beetlers are people who work in cotton mills—not members of the order Coleoptera.

This bibliography represents a great deal of exacting, routine work and will be of considerable service to students in the auditory field.

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Integers and Theory of Numbers. Abraham A. Fraenkel. Scripta Mathematica, Yeshiva University, New York, 1955. 102 pp.

This volume, the author explains in the preface, is essentially a translation of the first part of his earlier book, *Mavo LeMathematika,* which was written in Hebrew and grew out of talks given by him, over a period of many years, as part of the adult-education program in Israel. It is to be followed by two more volumes of a similar nature, one on the fundamental concepts of modern algebra, the other on the theory of sets.

The four chapters are entitled "Natural numbers as cardinals," "Natural numbers as ordinals," "Theory of numbers," and "Rational numbers." The first, second, and fourth present a construction of the number system through the rationals. Many results are proved, but there is no attempt to provide a step-by-step development, such as is found in Landau's *Grundlagen der Analysis.* The third chapter discusses some of the well-known results and unsolved problems of classical number theory. Throughout the book there are numerous references to more detailed treatments of various topics.

The foregoing remarks do not, however, do justice to the book. It is an attempt by a mathematician of wide and deep learning to give the intelligent layman some understanding of the nature of our number system and of mathematics in general. It will prove to be a difficult book for such a person, and I shall not try to predict how many there will be who will devote the necessary effort to the task. Those who do, however, will find it an enlightening and stimulating experience.

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The Nitrogen Metabolism of Micro-organisms. B. A. Fry. Wiley, New York; Methuen, London, 1955. ix + 166 pp. Illus. + plates. $2.

In this little Methuen monograph B. A. Fry has achieved his aim: "to survey as comprehensively as possible the nitrogen metabolism of microorganisms and . . . to reflect current trends in modern biology." This book is a survey, and, like a surveyor, Fry covers a vast area going from one well-defined point to another with brief attention to the details between. The area of nitrogen metabolism has been covered well; if any major points have been omitted I was not aware of them. Those who might wish to get more details will find the list of references very complete. "Current trends in modern biology" are reflected especially in chapters on absorption of amino acids and on the mode of action of chemotherapeutic agents.

This monograph, for a modest cost, will provide all but a specialist in the field with a fine introduction to nitrogen metabolism.

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Biochemistry and Physiology of Protozoa. vol. II. S. H. Hutner and A. Lwoff, Eds. Academic Press, New York, 1955. xiv + 388 pp. Illus. $9.

By virtue of their favorable characters as compared with other microorganisms and with a growing number of forms cultivable *in vitro* free from other organisms, Protozoa are becoming increasingly popular as "biochemical tools." Therefore, the appearance of the second vol-