MAGNETISM

Modern Magnetism. By L. F. BATES. ix + 340 pp. Cambridge: at The University Press. New York: The Macmillan Company. 1939. $4.50.

IN many universities, the study of the magnetic properties of matter is not strongly emphasized, and the study of the experimental work in this field is almost totally neglected. This volume by Professor Bates, of the University College, Nottingham, is particularly welcome to both the student and the teacher for its presentation of much material which is unavailable except in the original publications. Although written primarily from the experimental point of view, the underlying theory is not neglected, and the work is by no means a mere compilation of observations. Proceeding from definitions of elementary quantities with no attempt to discuss the subtleties here involved, a rapid survey is made of atomic structure in terms of the vector model, and of the elementary theories of susceptibility. This is followed by descriptions of the methods of magnetic measurements and a review of the results of susceptibility measurements on isotropic and crystalline material. The measured susceptibilities are tabulated together with the electronic structures of the elements. It is unfortunate that references to the sources of the quoted values are not given. The chapters on atomic beams and nuclear spins and magnetic moments are interesting, particularly in view of the fundamental theoretical significance of the results. After a description of the several gyromagnetic effects, the volume closes with three chapters which summarize the experimental results involving the complicated phenomena of the behavior of the ferromagnetic domains, the energy changes and magnetostriction. In view of the enormous complexity and our lack of complete understanding of these phenomena, this portion of the volume is as well organized and digested as is possible without adding considerably to the length and detracting from the book's usefulness. The volume has both name and subject indices and a particularly complete table of contents, making it possible to locate any subject with ease.

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RADIOACTIVITY

A Manual of Radioactivity. By GEORGE HEVESY and F. A. PANETH. Second edition, xvi + 306 pp., translated by Robert W. Lawson. Oxford University Press. 1938. $5.50.

ALTHOUGH this is designated as the second edition, it is in reality the fourth, since extensive revision was done each time the volume was translated into English. The merit of this excellent text-book has been much enhanced by the inclusion of the recent rapid advances in the field, and a revision of the older material in conformance with modern concepts. Chapters have been much enlarged or new chapters added which deal with positrons and neutrons, artificial radioactivity, the transmutation of the elements, the use of radioactive materials as indicators and so forth; and an appendix describing the cyclotron has been added. The volume suffers, as did indeed the former editions, from attempting to cover so large an amount of material in a relatively short space. But this ambitious program is precisely what renders the work most useful. Besides the physical aspects of radioactivity, its relations to the fields of chemistry, geology and even biology are outlined, and these relationships form a structure which it is possible to embellish with all the details and elaborations which the lecturer cares to add. Sufficient references to other works and to original papers are provided. The work of the translator has been well done. As a whole, the volume is a worthwhile addition to any library.

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SPECIAL ARTICLES

THE PATHOGENIC ACTION OF PHYMATOTRICHUM OMNIVORUM

CYTOLOGICAL studies[1] of cotton roots attacked by *Phymatotrichum omnivorum* (Shear) Duggar have presented indirect evidence of the importance of chemical action in the process of parasitism by this fungus. The data from cytological preparations were not accompanied, however, by experimental evidence of the type so well known for various fungi that cause rotting of plant tissues.[2] Henderson[3] has described toxic action on cotton seedlings by thermostable substances in filtrates from cultures of the fungus on liquid media. She found that the decreased pathogenicity resulting from continued culture on artificial media tends to be regained after growth upon a suitable living host. In the present work pure cultures of the fungus have been maintained in successive

[1] G. M. Watkins, *Amer. Jour. Bot.*, 25: 118–124, 1938; *Phytopath.*, 28: 195–202, 1938.

[2] Summary by W. Brown, *Bot. Rev.*, 2: 236–281, 1936.

[3] L. Henderson, *Amer. Jour. Bot.*, 24: 547–552, 1937.