sterol (coprostanol) is not so treated, although it is mentioned elsewhere incidentally in the text. As a naturally occurring sterol, coprosterol should surely have been accorded individual treatment.

The occurrence of ergosterol in ergot, from which fact it derives its name, might have been mentioned. It is true that it also occurs in yeast, which now constitutes its chief source.

Finally, it seems a pity that a chapter has not been devoted to the steroid alkaloids, particularly as individual members of this group are occasionally mentioned in the text.

E. STEDMAN

POLYMER CHEMISTRY

The Kinetics of Vinyl Polymerization by Radical Mechanisms

By Dr. C. H. Bamford, Dr. W. G. Barb, Dr. A. D. Jenkins and Dr. P. F. Onyon. Pp. xii+318. (London: Butterworths Scientific Publications; New York: Academic Press, Inc., 1958.) 50s.; 8.80 dollars.

The Effects of Ionizing Radiation on Natural and Synthetic High Polymers

By Frank A. Bovey. (Polymer Reviews, Vol. 1.) Pp. xiii+287. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1958.) 8 dollars.

Physical Chemistry of High Polymers

By Dr. Maurice L. Huggins. Pp. 175. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1958.) 52s. net.

THE mechanism of vinyl polymerization has probably been studied in more detail than that of any other kind of chemical reaction, and in this book Dr. Bamford and his co-authors have presented a unified and thorough treatment of this important subject.

The two first chapters discuss the broad theoretical concepts upon which the subject rests, and the following four chapters summarize critically the experimental data for most of the important monomers and the relation of these results to the general theoretical developments. The chapter on heterogeneous polymerization—which refers only to those polymerizations in which the propagating radicals pass from one phase to another—is an original treatment based largely on the authors' own studies, and is particularly valuable since this subject is rarely dealt with in the standard works on polymer kinetics. The final chapter treats the statistical aspects of vinyl polymerizations and in particular the calculation of molecular weight distributions. This book is the most complete and up-to-date survey of the subject the reviewer has seen and it can be highly recommended to students and others interested in the synthesis of high polymers and to those chemists with wider interests in the mechanism of free radical reactions.

The book by Dr. Bovey is the first of a new series of "Polymer Reviews" (edited by Prof. H. Mark) in which emphasis will be placed on the principles and state of knowledge of newer developments in polymer chemistry, and it has set a very high standard. Although the importance of a study of the effects of radiation on dead and living matter has been recognized since the discovery of X-rays (1895) and radioactivity (1896), the greatest stimulus to the present-day intensive study of the subject has been the

development of nuclear reactors and the application of high-intensity radiations. The consequent need to understand the effects of these radiations over long periods of time both on ordinary materials of construction and on living cells is obvious. In the use and application of high polymers it is clearly necessary to have a clear understanding of the mechanism of the beneficial aspects of radiation such as the improvement in mechanical properties of some plastics by cross-linking and also the scientific information which will permit the development of polymers which resist the effects of radiation. More important still may be the understanding of the effects of radiation on the polymeric material which constitutes cells and other living organisms.

This book is timely in that it reviews in a critical manner the basic results so far obtained in the study of the irradiation of high polymers. The opening chapters summarize the general properties and chemical effects of radiation and the radiation chemistry of high polymers in particular. The remaining chapters deal with the various synthetic and natural polymers in detail. The book as a whole is a thorough, critical and reliable review of this growing subject. It is a most stimulating account of the theoretical and practical aspects of what has rapidly become an important branch of polymer science.

Dr. Huggins's book is based on a course of lectures he delivered in Japanese universities and emphasizes his own important and fundamental contributions to chemistry. The book as a consequence is uneven in character. Brief reference only is made to many of the important aspects of polymer synthesis and properties whereas the valuable theoretical work of the author on the thermodynamic properties of solutions is described in detail. Other interesting chapters are those on dynamic properties of polymers and their solutions and on the general aspects of the structures of natural and synthetic high polymers. The author presents many original points of view and in this sense the book is of value to the specialist. Although covering the whole physical chemistry of polymers, the book is too condensed to be of great value to the student seeking a basic introduction to the subject.

C. E. H. BAWN

MICROBES AND MILK

Dairy Microbiology

By Prof. Edwin M. Foster, Prof. F. Eugene Nelson, Prof. Marvin L. Speck, Prof. Raymond N. Doetsch, and Prof. Joseph C. Olson, Jr. Pp. xvi+492. (London: Macmillan and Co., Ltd., 1958.) 42s. net.

THE authors of this book are all professors or associate professors of bacteriology or dairy bacteriology in teaching institutions in the United States; this strengthens the impression, while not motivating it, that "Dairy Microbiology" is in several ways tailored to the American system of education. It is a form of students' text-book, though, as the authors hope, it should have considerable appeal in other fields, particularly technology, largely as a ready-reference book. Broadly, the first six chapters deal with the general application of microbiology to dairying, and the remaining nine with the microbiology of specific dairy products, waste disposal and the utilization of by-products. With the exception