rial on the part of the reader. Except for reservations concerning the above-mentioned errors, it will probably fulfill the author's aim of conveying the broad fundamentals of enzyme chemistry to the beginner in a relatively painless manner. The format and printing is very acceptable, and there are few if any typographical errors.

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ROCHESTER, NEW YORK ALEXANDER L. DOUNCE

Silage Fermentation. By A. J. G. BARNETT, B.Sc., Ph.D., F.R.S.E., Lecturer in Agricultural Biochemistry, University of Aberdeen. Academic Press, Inc., Publishers, 125 E. 23rd Street, New York 10, New York. 1954. x + 208 pp. 14.5 × 22 cm. Price, $5.00.

The author has succeeded in his primary purpose ". . . . to present to the student a review of the whole question of silage largely in relation to its interest as a subject of scientific study." Within the scope of approximately 200 pages he has presented in good form and style pertinent information relating to silos as well as to the production, physical nature, chemical composition, biochemical processes and nutritional value of silage. The coherent discussion on silo construction, silage processes and silage utilization is supplemented throughout the nine chapters by 53 tables of data, five drawings, ten photographs and thirty-five graphs.

More than 400 references to the original literature are cited with as few as 22 and as many as 92 appended to each chapter. In keeping with the author's emphasis upon silage practices and experimentation in Scotland, Finland and some other European countries only about one fourth of the references selected refer to developments in other world areas. In a section entitled Bibliography the following three companion books are listed as authoritative works: (1) S. J. Watson, "The Science and Practice of Conservation," Grass and Forage Crops (2 vols.), London, 1939, (2) S. J. Watson and A. M. Smith, "Silage," London, 1951, and (3) R. O. Whyte, "The Production and Utilisation of Silage," Aberystwyth, 1949. Three other useful treatises not mentioned by Barnett are: (1) H. E. Woodnan and A. Amos, "Ensilage," Bull. No. 37, Ministry of Agriculture and Fisheries, London, 1949 and (2) J. A. S. Watson, "Grass Drying," Bull. No. 157, Ministry of Agriculture and Fisheries, London, 1953, and (3) Grass, in the "Yearbook of Agriculture," U. S. Dept. of Agriculture, Washington, D. C., 1948. Additional research reports on grass and silage not included in the author's book have been published particularly in the bulletins of experiment stations in the Netherlands, Japan, Czechoslovakia and the United States.

An outstanding feature of the book is found in Chapters 7 and 8 where clear directions are given for sampling and drying silage and for the determination of *p*H, total nitrogen, soluble nitrogen, protein, protein digestibility, oil, fiber, ash, total hydrolysable carbohydrate, lactic acid, volatile and non-volatile organic acids, lignin, nitrate, nitrite, ascorbic acid, carotene, calcium, phosphate, magnesium, sodium, potassium and amino acids of silage. Chromatographic procedures are described for the determination of amino acids and volatile fatty acids.

A glossary of nine terms and five pages of index are given at the end of the book.

Present-day understanding of silage fermentation is expressed in the following statement by the author in his Introduction.

"Compared with what remains to be discovered, little is really known about the true composition of grass and the modes of biosynthesis of the different recognized components of the material. Even less is known of these matters in the case of silage because there we have the original complex state of affairs confused by not only one but many different biochemical processes. Thus, as will appear in the text, we can at this stage merely hazard a guess sometimes as to what happens during the fermentation, basing that guess on what is, perhaps, incomplete knowledge of the basic facts about the initial crop."

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The Vitamins: Chemistry, Physiology, Pathology. Volume I. Edited by W. H. SEBRELL, Jr., Director, National Institutes of Health, Bethesda, Maryland, and ROBERT S. HARRIS, Department of Food Technology, Massachusetts Institute of Technology, Cambridge, Massachusetts. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. xiii + 676 pages. 16 × 23.5 cm. Price, $16.50.

This book is the first of a 3-volume series. The editors point out in their preface that clinical manifestations of vitamin deficiencies and their treatment have not been presented in detail, as they have been covered in other publications. Methods of vitamin assay are discussed in some cases only briefly for the same reason. "The Vitamins" will provide an invaluable reference book for those concerned primarily with the chemistry and biochemistry of vitamin A and the carotenes, ascorbic acid, vitamin B_{12} and biotin.

No single chapter has been handled in its entirety by one author; however, the volume does not suffer from undue repetition. The four chapters have 21 contributors. The extensive bibliography will be of aid to the student of nutrition who wishes to consult original papers. The completeness of the coverage is attested by the more than 500 references on vitamin B_{12} alone. The isolation of this vitamin was announced only in 1948.

An innovation is the inclusion of sections on the industrial production of the several vitamins.

It is unfortunate that any book in the field of nutrition is unavoidably outdated by the time of publication. This volume is no exception, for most of the papers cited were published prior to 1953.

The editors are to be congratulated in enlisting the cooperation of so many outstanding contributors both from this country and abroad.

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Crystal Structures. Index to Organic Compounds. By R. W. G. WYCKOFF. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. 33 pp. 20 × 25 cm. Price (this is part of subscription to Section III).

This index to the previously issued (and reviewed[1,2]) chapters dealing with the structures of organic compounds further enhances their value.

(1) J. Donohue, THIS JOURNAL, **74**, 5554 (1952).
(2) M. L. Huggins, *ibid.*, **75**, 6089 (1953).

RESEARCH LABORATORIES
EASTMAN KODAK COMPANY MAURICE L. HUGGINS
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Advances in Cancer Research. Volume II. Edited by JESSE P. GREENSTEIN, National Cancer Institute, U. S. Public Health Service, Bethesda, Maryland and ALEXANDER HADDOW, Chester Beatty Research Institute, Royal Cancer Hospital, London, England. Academic Press, Inc., Publishers. 125 E. 23rd Street, New York 10, N. Y. 1954. xi + 530 pp. 16 × 24 cm. Price, $11.00.

The editors are to be congratulated on this, the second volume of the series, since it maintains the high aims and standards set by the first. About half of the volume is concerned with carcinogenesis and contains chapters entitled, "The Reactions of Carcinogens with Macromolecules" by Peter Alexander of the Chemistry Department, Imperial College, London, England; "The Chemical Constitution in Carcinogenic Activity" by G. M. Badger of the Chemistry Department, University of Adelaide, Australia; "Carcinogenesis and Tumor Pathogenesis" by I. Berenblum of the Department of Experimental Biology, Weizmann Institute of Science, Rehovoth, Israel; "Ionizing Radiations and Cancer" by Austin M. Brues, Argonne National Laboratory, Lemont, Illinois, and "The Role of Viruses in the Production of Cancer" by C. Oberling and M. Guerin, Institute for Cancer Research, Seine, France. The first two chapters listed are of particular