Thunderstorm Electricity

Edited by Horace R. Byers. Pp. viii + 344. (Chicago : University of Chicago Press ; London : Cambridge University Press, 1953.) 45s. net.

THE volume under review is a compendium based on contributions to a conference held in Chicago in 1950, some of which have been brought up to date, together with a few chapters from other workers. The chapters deal in turn with general results of atmospheric electricity, thunderstorm dynamics, cloud physics and charge generation, followed by chapters dealing more directly with thunderstorm electricity and finishing with lightning and its effects on aircraft and power lines. As a collection of separate contributions, the book naturally suffers from a lack of coherence, and as a volume on "Thunderstorm Electricity" it may be criticized in that a great many of the chapters are not directly connected with that subject, but contain background information ; for example, in the longest chapter, Chapter 5, by H. Weickmann, a mere three pages out of seventy-three are concerned with electrical phenomena.

But every chapter is of considerable interest to those whose work is at all connected with thunderstorms, though the chapters themselves are uneven in content : for example, Chapter 3, by L. Koenigsfeld, describes new work, perhaps more suitable for publication in a journal than in such a volume ; Chapter 8, by R. Gunn, is a useful summary of his previously published work ; and Chapter 14, by H. Norinder, combines a historical survey with an account of recent work.

The volume is attractively produced, and the large numbers of diagrams and plates are very clear. The nature of the volume has made cross-references impossible, but an index would have greatly added to its value.   J. ALAN CHALMERS

Infinite Abelian Groups

By Irving Kaplansky. (University of Michigan Publications in Mathematics—No. 2.) Pp. v + 91. (Ann Arbor : University of Michigan Press ; London : Oxford University Press, 1954.) 16s. net.

A REMARKABLE amount of material has been compressed into this monograph. After some examples of Abelian groups, definitions follow, together with some properties, of torsion groups and divisible groups. Then pure subgroups (Servanzuntergruppe) and groups of bounded order are studied, and the important notion of height is introduced. This leads up to Ulm's theorem, which, involving both cardinal and ordinal numbers, gives a complete classification of countable torsion groups. The next part is concerned with the extension of preceding results to modules over principal ideal rings and an application to the theory of linear transformations. Then the ring is restricted to a discrete valuation ring R, and a study is made of a complete R-module (that is, complete in its p-adic topology). A partial classification of the submodules of a given module is made in terms of the characteristic submodules, and the account ends with a review of recent literature.

The material presented is part of a course of lectures given in 1950 in the University of Chicago. Prof. I. Kaplansky has a crisp, vivid style, and a pleasant feature is the interruption of the text at various points to ask a pertinent question such as "What is our goal in studying Abelian groups ?", or "How do we know when we have a satisfactory theorem ?". The general atmosphere of the book is one of freshness and vigour, and the reader has the satisfaction of knowing that he is being led right up to the edge of our knowledge of a branch of modern infinite algebra.   L. S. GODDARD

Applied X-rays

By Prof. George L. Clark. Fourth edition. (International Series in Pure and Applied Physics.) Pp. ix + 843. (London : McGraw-Hill Publishing Company, Ltd., 1955.) 89s. 6d.

THE previous edition of this book—one of the McGraw-Hill International Series—was published thirteen years ago. In that time a great deal of development has taken place in the application of X-rays to almost all branches of science, and the attempt to cover all these applications has produced a work that is generally unsatisfactory.

It must now be accepted that the subject of X-rays and their applications is too large to be covered by a single text-book, and the present book can only be regarded as a rather poor patchwork ; it covers instrumentation, radiography, biological applications, X-ray diffraction and crystal chemistry. The author seems at his best in the earlier sections, the later sections being much too condensed and not distinguished by any originality of the point of view.

The presentation of much of the material seems hurried and careless. Several tables are reproduced from other works, sometimes without adequate explanation, sometimes with mistakes, and sometimes without acknowledgment. There are numerous mis-spellings of names in the references, and there is no author index. Altogether, the book must be regarded as a rather unworthy companion to the other members of this important series. Finally, I would like to ask why, in general, American books are printed on such heavy paper ; this one weighs 3 lb. and is most uncomfortable to handle for prolonged periods.   H. LIPSON

Organic Syntheses—Collective Volume 3

Edited by E. C. Horning. (A Revised edition of Annual Volumes 20–29.) Pp. x + 890. (New York : John Wiley and Sons, Inc. ; London : Chapman and Hall, Ltd., 1955.) 120s. net.

THIS work, begun as an annual publication in 1921 under the original editorship of Prof. Roger Adams, has proved from the first to be a practical aid of very high value to students and research workers in organic chemistry and biochemistry. It is a thoroughly reliable, accurate and comprehensive vade mecum for all who are actively engaged in these great and expanding fields of science. It was a happy thought of the editors to issue a collective volume at intervals, and the third volume of this kind includes the classified and revised material of annual Vols. 20–29.

In all, particulars are here given for the preparation of more than three hundred and fifty organic compounds and reagents, and there are details of new procedures for acenaphthenequinone, aminoacetal, α-tetralone, and several other substances. References have been brought up to date and linked with Chemical Abstracts in order to facilitate a complete search of the literature. The vast amount of material in the book has been made readily accessible by means of indexes of reactions, types of compounds, formulæ, solvents and reagents, and illustrations, in addition to a comprehensive general index. Altogether, this collective volume, like its two predecessors, is a time-saver of the first order. JOHN READ