

fusing, as it involves, for example, the separation of the savoy from the cabbage by no less than six chapters, although both vegetables have many features in common. A more natural sequence would have been obtained by discussing the vegetables of the *Brassica* genus in consecutive chapters.

The book is well illustrated by drawings and photographs, and there is an excellent index. The botanical information is not always accurate, one obvious inaccuracy appearing in Fig. 1, in which the siliqua of the wild cabbage is depicted dehiscing from the apex towards the base. Such details, however, do not detract from the value of the book to the practical man, and commercial growers and private gardeners alike will find this volume invaluable.

"Grain Crops" is an expansion of outlines of a course of lectures on the various phases of the production of grain crops, given to students in the College of Agriculture, University of Minnesota. The subject-matter is arranged in twenty-three chapters, of which the first eight are concerned with a very brief review of the fundamentals of botany, plant classification, the world distribution of grain crops, and a general discussion of their culture. This section is followed by a more detailed discussion of individual grain crops, and these include not only the members of the grass family but also such crops as flax, buckwheat and soybeans. The book concludes with a chapter on the improvement of grain crops.

Each chapter is followed by a list of review questions and a bibliography; but one seeks in vain for a reference to any literature other than American. With the exception of the mention in a footnote of "The Wheat Plant" by John Percival, all literature published outside the United States is ignored. The whole subject is treated purely from the American point of view, since crop rotation, methods of culture, lists of varieties, storage and uses of the various crops all refer solely to American conditions.

While this book is undoubtedly very useful for the American agricultural student and the American farmer, it is of very limited value to agricultural students in Great Britain or, indeed, in many countries outside the United States. The omission of references to work on grain crops by men of science in other countries emphasizes this statement, and surely the "more advanced students", mentioned by the author in his preface, would profit enormously if the "liberal use of selected references" was more truly liberal and indeed international. A. G. ERITH

## CRYSTAL STRUCTURES OF INORGANIC COMPOUNDS

### Crystal Structures

By Ralph W. G. Wyckoff. Section 1. Pp. viii + 442. (New York and London: Interscience Publishers, Inc., 1948.) 48s.

IN 1931 Dr. R. W. G. Wyckoff's "Structure of Crystals" was published and was followed by a supplement in the year 1934; these volumes contained the results of crystal-structure determinations up to about 1933, and many X-ray crystallographers will have found them of utmost value, both as sources of information about structures and as sources of references.

The present work will therefore be greeted by many as an old friend, and they will not be disappointed in its contents. The sections on crystal-structure determination have disappeared, while the discussions of structures and the relationships between them have been extended in the light of recent theories. The details of the structures are repeated from the earlier volumes, together with the well-known diagrams, but the references begin at the year 1933, where the first supplement finished.

There are, however, many changes. The book is published in loose-leaf form, and is printed in imitation typescript; only about half of the book is yet produced, and the rest is to be published in two sections. The author has adopted this method of procedure in order that the main part of the book could be published within a reasonable time; corrections may be made later by the substitution of pages, and new material can be added in appropriate places. The part so far produced is on inorganic structures, arranged in order of complexity of chemical formulae—elements, compounds  $AB$ , compounds  $AB_2$ , etc.—and the two further sections promised are to cover the inorganic compounds that remain and organic compounds.

One cannot but agree that this method of publication has its advantages for this sort of work, and one must bear with the disadvantages that are inevitable in loose-leaf publications. The pages tend, of course, to misalignment, although they are well clamped together by a simple device. Some instruction on the method of release of the covers would be valuable; X-ray crystallographers may be used to trial-and-error methods; but they do not wish to try them on their books.

The text is, on the whole, well written, although there are some phrases that ring strangely to the British ear: "non-rare gas shell atoms" is an awkward construction that cannot be improved by any ordinary method of hyphenating, and "fifth-column elements" has not the happiest of connotations. The author has also a tendency to use too few commas, as the following extract shows: "If as was done in Chapter II when discussing cobalt and the two forms of graphite layers in these three positions are designated as 0, 1 and 2, then . . ."; a comma after graphite is definitely required.

A technical difficulty, with which the author has unfortunately made no attempt to cope, is that due to the recent change in unit of measurement. Measurements are all given as in Angstrom units; but they are actually in kX. units. If it was not possible to correct all the dimensions given, a covering note explaining the difficulty should have been given; one hopes that such a note will appear in the further sections. But there is no doubt that difficulties will begin to appear when present structures, quoted in true Angstrom units, are included.

The book will inevitably be compared with the "Strukturbericht". Both works cover the same ground in much the same fashion, and it is in this respect that the author claims that the loose-leaf form of publication should have a decided advantage: it will enable all the data for a given material to be kept together, whereas with the "Strukturbericht" one has to look through all the volumes. It will be interesting to see how the experiment works in practice. Certainly all X-ray crystallographers will wish it well and will be grateful to Dr. Wyckoff for the large amount of time and effort that he has obviously spent in compiling the work. H. LIPSON