

*The Arrangement of Atoms in Space.* By J. H. VAN'T HOFF. Second, Revised and Enlarged Edition. With a Preface by JOHANNES WISLECENUS, and an Appendix, Stereochemistry among Inorganic Substances, by ALFRED WERNER. Translated and Edited by ARNOLD EILOART. London, New York and Bombay, Longmans, Green & Co. Pp. xi + 211.

In the earlier development of theories with regard to the structure of chemical compounds, chemists were very careful to state that the formulæ used were not intended to represent, at all, the actual geometrical positions of the atoms within the molecules. It was with a great deal of scepticism, therefore, that the chemical world received the first attempts at a logical discussion of the arrangement of atoms in space. These attempts were made by van't Hoff and by Le Bel, independently, in 1874. For many years the theory made little headway and, at most, received some notice in connection with the discussion of optically active substances. Gradually, however, the theory proved so useful that the present situation is well summarized in the following words of Professor Wislecenus from his preface to this book:

"The old opposition to the principle has almost died out; where it still lives it is directed against the ultimate basis—against the Atomic Hypothesis itself—and does not deny that the doctrine of atomic arrangement in three dimensions is a logical and necessary stage, perhaps the final stage, in the chemical theory of atoms. \* \* \* It has already effected to the full all that can be effected by any theory; for it has brought into organic connection with the fundamental theories of chemistry facts which were before incomprehensible and apparently isolated, and also enabled us to explain them from these theories in the simplest way. By propounding to us new problems, the new theory has stimulated empirical investigations on all sides; it has caused a vast accumulation of facts, has led to the discovery of new methods of observation, has become amenable to the tests of experiment, and has at the same time started in our science a movement full of significance—in a certain sense, indeed, a new epoch."

The present work is a new and thoroughly revised edition of van't Hoff's well-known book. It is especially satisfactory in its discussion of stereoisomerism in its relation to optical activity. The consideration of ethylene derivatives and of ring compounds is also sufficiently full, while the concise treatment of the stereochemistry of nitrogen compounds accords well with the present rather unsatisfactory conditions of the topic. The brief statement by Alfred Werner of his views upon the stereoisomerism of certain inorganic compounds is an important and valuable addition.

The present book is noteworthy for the manner in which the fundamental conception is reduced to the simplest possible expression. All hypotheses which are not absolutely essential are omitted. In this respect the book is in marked contrast with that of Auwers on the same subject.

In a few cases, and especially for camphor and atropine and their derivatives, structural formulæ are given which are, to say the least, very improbable, if not entirely impossible, according to our present knowledge. While questions of optical activity are undoubtedly of great importance in the discussion of possible formulæ for these compounds, it seems unfortunate that such doubtful formulæ should have been used in the consideration of the fundamental principles of asymmetry as connected with optical activity.

The work of translation has been well done, and the translator, who is an authority on the subject, has added several important notes of his own.

W. A. NOYES.

*Laboratory Experiments on the Class Reactions and Identification of Organic Substances.* By ARTHUR A. NOYES and SAMUEL P. MULLIKEN. Second, Thoroughly Revised Edition. Easton, Pa., Chemical Publishing Co. Pp. 28. Price, 50 cents.

This little book may be considered as the elements of qualitative analysis for organic compounds. Because of the enormous number of these compounds the subject is not susceptible of any such set mechanical treatment as is usually given to inorganic qualitative analysis. For this reason it is all the more useful for the purpose of developing thoughtfulness and