to deep rose as the flower fades, and there are a number of misprints, including *Oenothera taraxicifolia* for *taraxicifolia*, despite a note on the derivation of the word.

The author has seen many of the plants mentioned himself in their native countries, and the best chapter in the book is, perhaps, that on the giant plants of the East African mountains which he visited recently with the Natural History Museum expedition.

One of the most striking features of the book are the illustrations. These are taken partly from

Thornton's "Temple of Flora", partly from other botanical works, partly from original drawings by John Nash and partly from photographs. It is a pity that the source of each illustration is not more clearly indicated. John Nash's drawings are delightful, that of *Puya alpestris* being a masterpiece of its kind. Mention might have been made of Miss North's painting of Puya in her gallery at Kew.

As a bedside book for gardeners and botanists, Mr. Synge's volume will no doubt appeal to a wide circle of readers.

J. S. L. GILMOUR.

PHOTOCHEMISTRY

Photochemistry and the Mechanism of Chemical Reactions

By Prof. Gerhard K. Rollefson and Dr. Milton Burton. (Prentice-Hall Chemistry Series.) Pp. xiv + 445. (New York: Prentice-Hall, Inc., 1939.) 5.75 dollars.

THE task of writing a modern text-book of photochemistry is no easy one. To keep the volume within reasonable confines is almost as difficult a problem, since the limits to which the author must work are not readily defined. If the author does not presuppose it, a considerable discussion must be devoted to physical principles, especially on the spectroscopic side. Again, photochemistry now reaches far into biology, and the question arises as to whether such a topic should be included in a book mainly compiled for use by physical chemists. Another subject with which it is indissolubly linked is reaction kinetics, for it is difficult to dissociate photochemistry from kinetics, having regard to the fact that there are scarcely any simple photo reactions in the sense that the primary process represents the chemistry of the whole reaction. It is not going too far to say that a large part of photochemistry is now a branch of general reaction kinetics.

In this volume Prof. Rollefson and Dr. Burton have steered a careful middle course. They open with three chapters giving a sufficient account of spectroscopy, yet not enough to frighten off the reader who is concerned only with the more purely chemical aspects of photo-reactions. Similarly, the chapter on reaction kinetics leads the reader without difficulty into the more detailed discussions in the later parts of the book. Then follow the chapters forming the substantial fraction of the book. Nowadays the arrangement is largely a matter of personal choice, for there is no sufficiently rigid framework within which can be fitted the

descriptions of the individual types of reaction. The simplest photo-reaction is probably that occurring in alkali halide crystals. Here recent work has added a new and important chapter to photochemistry. Then follow chapters on the photolysis of inorganic compounds, organic molecules, molecular rearrangements, photosensitization and typical chain reactions—all in the gas phase. In these chapters much of the older material is eliminated and only the more recent papers discussed. This is region of great difficulty since there are many reactions to be discussed, but each gets its due quota of space. Even in 200 pages only superficial discussion of any one may be given. It would have been a better plan to have discussed thoroughly and completely a few well-known examples at the expense of the omission of less well-investigated systems. The adoption of a more critical attitude would have done photochemistry no disservice. The specialist would welcome such discussion even though he might not agree with the conclusions. The beginner would be made to realize that the subject is more difficult than he is led to suppose.

The last four chapters of the book deal with topics which are only now in an early stage of development. Addition reactions, the oxidation of aldehydes, polymerization reactions in liquids and heterogeneous photo-reactions are all fairly extensive fields of research in which there is much to be done before a really coherent account may be put in a text-book. A very useful practical appendix completes the volume.

Here then is a book which allows anyone with no specialist knowledge easy access to photochemistry. Those who wish to find what is known about an individual reaction will discover the required information. Those who are already familiar with the subject will find much food for further thought and experiment.

H. W. MELVILLE.