

down into chapters covering specific groups. In these chapters he discusses in considerable detail typical regions of absorption of the various groups and the way in which interactions between groups affect the absorption regions. In the book he follows what is coming to be standard practice among infrared spectroscopists—using wave numbers for band positions rather than wavelength in microns. The book contains a table of reciprocals for the convenience of those who prefer to think in terms of wavelength. Each chapter begins with a convenient outline of the correlations subsequently discussed and ends with a bibliography of the specific papers referred to so that the reader may go to the original source if he prefers. The bibliography is complete enough to permit the location of every significant contribution. At the beginning of the book there is a set of correlation charts, extending from 3750 to 650 cm^{-1} , that are more complete than any this writer has seen published heretofore. The book is quite well illustrated at the end of each main part with examples of prism spectra, although it would have been worthwhile to make reference to these figures at appropriate places in the text.

Both the persons beginning to acquire knowledge in this field, as well as persons already versed in it, will find this book indispensable.

ALVIN H. NIELSEN

*Department of Physics,
University of Tennessee, Knoxville*

Weather Modification: Past, Present and Future.

Kenneth M. Arenberg *et al.* Weather Modification Group, Wollaston, Mass., 1954. 50 pp. Paper, \$3.

Expanding interest in weather modification is manifest in this pamphlet report which can best be described as a digest summary of current literature coupled with the conclusions of the six authors.

A short discussion of the history of weather modification precedes a summary of the physical basis of modern cloud-seeding attempts and a brief outline of the Bergeron-Findeisen ice-crystal hypothesis. The process of rain formation without the involvement of ice was apparently unknown to the authors. The chapter on verification, highly colored by claims of various commercial cloud seeders, cannot be accepted as more than a selection of some of the current arguments.

The role of government and commercial enterprise is outlined, including a list of some government-sponsored projects and pertinent quotations from their reports. A fairly concise notion of the operation of a typical rain-making firm is given.

The best written and least controversial chapters deal with the potential application of weather modification and government regulations thereof. The authors feel that detailed federal regulation is unnecessary and that some of the cited Congressional bills are actually undesirable. They suggest that the government require cloud seeders to be licensed, require full reports of weather-modification activities, and as-

sume the liability of private contractors on government-sponsored projects.

The authors have successfully combed a difficult and controversial subject to prepare this acceptable report. However, it has several features that detract from its value. After explaining the "ice-crystal" precipitation hypothesis and showing that Dry Ice and silver-iodide seeding act in supplying missing ice nuclei to supercooled clouds, the authors ignore the problem of the frequency of clouds in need of such nuclei. The fact that precipitation often forms at temperatures warmer than freezing is overlooked. Much of the information concerning research projects at universities and in government is marginally factual. One gets the impression that the authors believe the best evidence for the effectiveness of cloud seeding is the fact that many persons are willing to pay for such services. Although this may be a perfectly valid test, many readers will prefer a conclusion based on more scientific evidence.

ROSCOE R. BRAHAM, JR.

Department of Meteorology, University of Chicago

Synthetic Methods of Organic Chemistry. vol. 8. An annual survey. W. Theilheimer. S. Karger, Basel; Interscience, New York, 1954. xv + 508 pp. \$18.90.

This work is an attempt to make new or improved synthetic methods readily available to the organic chemist. The series began with the literature appearing in 1942, and the present volume is drawn mostly from papers published from 1951 to 1953. The arrangement of the methods is based on an arbitrary system that takes into consideration the chemical bonds formed, the type of reaction, and the chemical bonds destroyed. For example, $\text{HC}\backslash\text{||}/\text{OC}$ represents the hydrogenation of a carbonyl group, the symbol between the chemical symbols indicating that the process occurs by addition. Although such a system easily builds up resistance in many chemists, it not only offers a basis for classification, but, more important, it facilitates thoroughness since the reactions of a functional group are found under the group and not, as is so often the case, under the numerous compounds containing the group. It should be added that the system can be avoided by using the extensive index (for vols. 6, 7, and 8) of more than 100 pages that list reactions by name, general topics, starting materials, and end products.

It is my opinion that this survey fills a definite need. The limited number of syntheses that are checked in the present volume appear to be properly recorded and give essential facts, such as the number and nature of the reaction steps, the yield, and the important literature. In spite of the many aids available to the organic chemist, this one offers a particular appeal, largely because the syntheses described are so recent. The author promises greater promptness in the volumes yet to come.

C. A. BUEHLER

Department of Chemistry, University of Tennessee