ence work. On the other hand, it is a very readable book. Equations are well integrated with the text. The line drawings are excellent. Each chapter ends with an extensive set of problems and numerous pertinent and up-to-date references (all the references cited are readily available books or monographs). Best of all, the complete list of the symbols used in each chapter is a happy answer to the confusion in meteorological symbols, which has been drawn from many sources.

In a one-semester course in physical meteorology, this book would serve as an excellent introduction to selected topics when used with the cited references.

D. P. KEILY
Department of Meteorology,
Massachusetts Institute of Technology

Chemistry and Taxonomy

Chemical Plant Taxonomy. T. Swain, Ed. Academic Press, New York, 1963. x + 543 pp. Illus. $16.

In this symposium of 16 articles, all by different authors, a successful attempt is made to survey the "scope and usefulness" of chemical taxonomy. The several general chapters range from "Methods of classical plant taxonomy" to "Biosynthetic pathways." The more specific chapters, ten in all, deal mainly with the taxonomic distribution of certain substances—the flavanoid constituents, alkanes, acetylenic compounds, fatty acids, aliphatic polyols and cyclitols, glycosides, anthocyanins, alkaloids, and sulfur compounds. Most of the work reported involves vascular plants.

I suspect that many (perhaps most) taxonomic readers will flounder in the chemistry, and the chemist in the taxonomy, but this is not necessarily a negative criticism. The information content in the respective fields is so extensive that we can hardly expect to find any large number of scientists who can speak both languages with ease.

A firm bridge is currently being established between chemistry and taxonomy, and this volume will do much to reinforce the connection. It is clear that many chemists are now expanding their horizons into problems of plant evolution at the same time that taxonomists are seeking new evidence from chemistry to fortify their systematic correlations. The conjunctions of viewpoints are leading to a salutary intercommunication between the two fields. We can expect a growing teamwork that should reveal important new generalizations.

The papers in this volume include those which are highly detailed and of interest mainly to specialists and those which are broader and useful to the general student and teacher. The book will probably serve mainly as a reference work. The single appendix gives a list of orders and families in the Spermatophyta (after Engler), but there are three separate indexes—authors, plant genera and species, and chemical compounds. Approximately 1400 literature references are scattered throughout the book.

One can find some interesting parallelisms between chemistry and plant taxonomy in this volume. For example, Erdtman writes that "the days are gone when the reputation of a chemist was proportional to the number of structural problems he had solved, just as that of a Bornean headhunter used to depend upon the number of his trophies." Something like this could be said about the taxonomist of the past whose prowess was in terms of the number of new species he had described.

Taxonomists, after having tried vainly for so many years to define that all-important but so elusive concept of "species," should take courage from the chemist's effort to make a clean-cut definition of "alkaloid" (compare pages 390 to 397). In the latter, incidentally, we find discussed a class of compounds of a "general alkaloid character" described as "pseudoalkaloids." Taxonomists with a particularly difficult problem might well take a cue and interpret their troublesome populations as "pseudospecies."

I should like to call attention to one procedural detail which does not emerge from this book and may be overlooked, namely the need for "voucher specimens." Phytochemical researchers who make detailed studies of plant substances should realize the importance of documenting their work by placing good specimens of their research plants in institutional herbaria. In this way only can the year-to-year vagaries of identification and naming be overcome and the published data be reliably associated with a definite plant.

A researcher or teacher interested *only* in plant taxonomy, or one interested *only* in chemistry, may well find this book peripheral to his interests. To those, however, who are directly concerned with the joint problems of plant taxonomy and chemistry, this volume cannot fail to be of major usefulness.

WARREN H. WAGNER, JR.
Department of Botany,
University of Michigan

Group Resources

Problem-Solving Discussions and Conferences. Leadership methods and skills. Norman R. F. Maier. McGraw-Hill, New York, 1963. viii + 261 pp. Illus. $6.95.

"The objective of skilled leadership is to dissipate the forces in a group that make for frustration and to utilize the group resources that make for cooperative problem solving. Groups have two assets that exceed those of any individual in the group: they possess more knowledge and they can think in a greater variety of ways." In the preface Maier states that, to take advantage of these assets, the "principles of group behavior must be skillfully used by the leader. What these principles are and how they may serve to improve meetings is the subject of this little book."

This volume is a highly condensed summary of the author's extensive experiments in the use of small conferences as a method of problem solving in industrial management. Although the procedures described apply most directly to meetings between a superior and a group of subordinates in an industrial setting, the results have wider application, in many instances, both in theory and in practice. The author's conclusions are based on the results of experiments in which the participants —students, teachers, or other experimental subjects—played the role of supervisor and subordinates who are presented with typical management problems.

Maier contrasts the quality of a decision with its acceptance and states that the method for achieving quality differs from that for achieving acceptance; he considers the methods inherently in conflict. Throughout the book he emphasizes the virtues of combining group decision with conference leadership skills. He also distinguishes between leadership methods and leadership skills and says that ". . . the *skill* of the discussion leader tends to upgrade the quality of the decision while the *method* tends to ensure accept-

ance." The bulk of the book is concerned with improving the quality of group decisions.

Chapter 3, "Problem solving," deals with locating the problem, locating the obstacles, avoiding traditional approaches, and using the group. The author says that a good discussion leader should be more involved in the problem solving process than in the problem to be solved and more concerned with the location of the problem than with the solution itself.

Chapter 5, "Conducting the discussion," contains many practical suggestions for any conference chairman or organizer. The topics covered are (i) two basic types of discussion—goal directed and problem solving, (ii) determining the appropriate type of discussion, (iii) procedures for dealing with feelings in a discussion, (iv) procedures for aiding problem solving, (v) stimulating and collecting ideas or solutions, (vi) the need for continued sensitivity, and (vii) the role of the leader.

Other topics that are clarified include "buzz sessions"; large group discussion and the limitations imposed by following *Roberts Rules of Order*; summarizing skills; sensibility; selecting problems for group analysis; confusion between problems, solutions, and choices; screening solutions to upgrade quality; and problem solving under conditions of uncertainty.

The author makes the assumption that the results of such experimental conferences will be valid for actual situations. The merits of this unstated assumption are difficult to assess. Nevertheless, Maier's volume will repay careful study by students of human relations problems in industry and of conference procedures in general.

FRANK FREMONT-SMITH
Interdisciplinary Conference Program, American Institute of Biological Sciences

Polymers

The Chemistry and Physics of Rubber-Like Substances. L. Bateman, Ed. Maclaren, London; Wiley, New York, 1963. xiv + 784 pp. Illus. $25.

This book on the chemistry and physics of natural rubber and related substances deals with the subject in such scope and depth that it will be of great interest and value not only to rubber technologists but also to polymer scientists generally. The 28 contributors present the development and the current state of the principal subjects covered by the scientific studies undertaken by the Natural (formerly, the British) Rubber Producers' Research Association since its inception 25 years ago. This association is one of three national associations set up in consequence of the International Rubber Regulation Agreement of 1934 to which the United Kingdom, France, and the Netherlands were parties. These associations have been supported by a cess levied against exports of rubber from the producing areas.

The point of view of the Natural Rubber Producers' Research Association in devoting its efforts to basic research is stated in a foreword by Sir Eric Rideal, who points out that at the time of its organization the industrial utilization of rubber was based on a highly developed technology to which a newly organized laboratory could scarcely make any contribution. He notes that at that time, in contrast to the advanced state of technology, the basic scientific knowledge of rubber was flimsy in the extreme. Accordingly, emphasis was placed on basic research in order to complement the technology of industry. The wisdom of this course is attested by the fact that natural rubber has been enabled to maintain a competitive position in a period during which the rubber product industry changed almost beyond all recognition.

The fields in which the association has carried out research cover almost the entire range of subjects relating to natural rubber from the biochemistry of latex and the composition and structure of natural rubber to graft polymers, the radiation chemistry of rubber, and the correlation of vulcanizate structure with properties. The treatment in the 19 chapters necessarily differs widely in character and scope. Some chapters relate to broad, extensively investigated fields such as viscoelastic behavior and the theory of rubber-like elasticity. Other chapters deal with problems that are more nearly self-contained such as abrasion and tire wear, the action of ozone on polymers, and the oxidation of olefins and sulfides.

In treating subjects about which different investigators have different views the viewpoint of the association has been presented, but this has been done with full attention to relevant research elsewhere. In each chapter numerous references are given to literature from all over the world, with adequate attention to pertinent comparative work on synthetic rubbers.

This book will be especially useful for reference, since it brings together the essential results of the research on natural rubber conducted by the association since its inception. These results have hitherto been available only in 452 papers published in widely scattered journals.

A. T. MCPHERSON
National Bureau of Standards, Washington, D.C.

Systematic Ichthyology

The Genera of Fishes and **A Classification of Fishes.** David Starr Jordan. Stanford University Press, Stanford, Calif., 1963. xviii + 800 pp. $17.50.

This facsimile reprint of David Starr Jordan's *The Genera of Fishes* and *A Classification of Fishes* will be welcomed by professional ichthyologists, students, museum curators, and all who need to refer to Jordan's works, for library copies are well worn or missing and the monographs have been out of print for some 30 years. *The Genera* (published between 1917 and 1920) consisted originally of four volumes, each with its own index, covering consecutive periods beginning with the work of Cuvier (1758) and ending with the writings of Jordan and his contemporaries (1920). *A Classification of Fishes* was published in 1923. In an excellent foreword George S. Myers explains the genesis and scope of Jordan's monographs and his attempts to stabilize icthyological nomenclature in accordance with the *International Rules of Zoological Nomenclature* (first adopted in preliminary form in 1892 and published in amended definitive form in 1905). Myers' historical account of Jordan's work and his role in training America's foremost ichthyologists will be read with nostalgia by many who, like myself, were students of Jordan's students.

In the composite volume, the separate indexes to each volume of the *Genera* and the generic index of the *Classification* have been discarded. A composite index to the *Genera,* which was prepared many years ago by Leonard P. Schultz and the late Hugh M. Smith but has been available only