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.

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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.

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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

in manuscript form, has been substituted. The familial index of the *Classification* has been retained. The revised indexes provide more facile access to the various parts of the combined work.

In the foreword Myers emphasizes the fact that there are many errors in Jordan's works which should have been corrected and comments on the need for a complete revision which would include the tremendous amount of work that has been accomplished in systematic icthyology since 1923. Until an ambitious and competent scholar, or a group of scholars (preferably a group of Jordan's students), undertakes and completes that herculean task and the manuscript is published, Jordan's combined works are indispensable and basic references and archives.

HILARY DEASON

AAAS

Industrial Chemistry

The Role of Diffusion in Catalysis. Charles N. Satterfield and Thomas K. Sherwood. Addison-Wesley, Reading, Mass., 1963. viii + 118 pp. Illus. $4.75.

This excellent short book is a welcome status report from a well-established field of chemistry and chemical engineering. In recent years, this field has enjoyed rapid theoretical and experimental progress, but there has been a dearth of general accounts, despite the considerable importance of the subject in the catalytic processes of the chemical and petroleum industries. The authors have recognized this importance and have directed their efforts toward persons who must consider the role of diffusion in catalysis in their research and development activities. They have given us a fairly lucid account which such readers may readily use to bring themselves up-to-date and which should also serve as a good introduction for the undergraduate or graduate student.

The three chapters and some of the subtopics are: "Diffusion" (in gases, liquids, and porous solids); "Mass transfer to catalyst particles" (including fixed beds, fluid beds, and slurries); and "Diffusion and reaction in porous catalysts" (including isothermal and nonisothermal cases, poisoning, and selectivity). After suitable introductions, each subtopic is developed theoretically, the experimental confirmation is cited, and then some comments that may be helpful to the practitioner are made. Criteria for estimating the importance of diffusion in experimentation are given. There are also fundamental data, such as a table of effectiveness factors that have been reported in the literature, and some numerical examples, frequently of industrial interest.

The quantitative treatment of the simple theory and the extensive literature citations, largely to work published during the last 5 years, give the book an authoritative aspect. However, the research worker will probably miss the elegance of the more extensive mathematical treatments, while a more extensive descriptive treatment would have been more suitable for some. But for many others, those who are attempting to combat technical obsolescence or those who are just beginning in this field, this will be a most useful book.

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Biology

The Physiology of Mosquitoes. A. N. Clements. Pergamon, London; Macmillan, New York, 1963. x + 393 pp. Illus. $12.50.

Clements presents the current knowledge on the functional characteristics of the mosquitoes in this outstanding monograph. His book is most welcome, and it is timely because the field is growing rapidly. The earlier recognition of the significance of mosquitoes as agents of distress and a later recognition of their potentialities as experimental animals have brought about a need for readily available information on the physiology of this group. This volume meets the need delightfully. As the principal source of information in its field and as a reference to principal sources for specific background information needed in planning research problems in invertebrate physiology, it will prove especially useful to advanced students in the biosciences. In like manner it should prove helpful to all who work in fields that involve invertebrates and to those who work on structures and functions of other forms of life, including the vertebrates.

The world literature including the more recent reports is adequately covered and well evaluated. The subject matter, which is organized around 16 main conventional topics that include all functions, is arranged in a logical sequence. The apportionment provides a reasonably well-balanced picture of the current state of knowledge. A systematic list of the species mentioned in the book is provided in an appendix. Selected illustrations, tables, and graphs from original sources (acknowledged) are used liberally throughout the book. Especially noteworthy are six plates of electron micrographs which show the finer structure of the midgut epithelium of adult female *Aedes aegypti* and *Aedes togoi.* These plates are a unique and valuable addition to the book.

In perusing the book one sees that probable gaps in knowledge are exposed, that unsolved problems are pointed out, and that differing views and seemingly conflicting data when not reconciled stand as open questions. I am hopeful and believe that this book will lead more than a few students to search for solutions to some of the many fascinating problems thus revealed. The worker beginning research may well be reminded that currently held conclusions concerning pertinent background information may not be firmly established and that repetition of some work may be necessary before he proceeds to an extended investigation.

The book is thoroughly documented and thus directs the inquiring student at all points to principal original sources. Complete references to these sources are conveniently given on the 41 pages that follow the appendix. An author index provides reference to each page upon which the author's contributions are cited. The reader is further aided by an adequate table of contents, a detailed subject index, and by a most helpful species index which combines associated subjects.

This book is volume 17 of the Zoology Division of the International Series of Monographs on Pure and Applied Biology. Characteristically, it possesses a high degree of excellence and is altogether pleasing. The material, which is well composed in a clear, simple style, well arranged and titled, and concise, is easily read and understood. The book is clearly printed on high quality paper and durably bound.

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