sion of the labor among various groups. The second edition of this book, in four volumes, follows this historical convention. Volumes 1 and 2, reviewed here, are concerned with the first part.

Volume 1, by Massey and Burhop, is devoted to electron-atom collisions, with slightly more than half the book devoted to experimental developments in the field. The authors give early 1967 as the closing date for inclusion in the book. The chapters on experimental methods and results seem to me best described as for experts. That is, the great detail and concern with methods seem directed toward a worker who is very much involved in the field or who intends to become so. Much space is devoted to developments subsequent to the first edition, and very many of the results of representative experiments are quoted. Especially gratifying (from a theorist's point of view) are the comments concerning possible sources of error in some of the experiments that have given conflicting results.

The last five chapters of the volume are devoted to theoretical work in the field. Here the book gives a general view of most of the methods currently used, although not as comprehensively as the experimental section does. Perhaps this part was meant to be taken in conjunction with *The Theory of Atomic Collisions* by Mott and Massey. Two omissions seem particularly lamentable. There is no mention, critical or otherwise, of a large body of theoretical calculation described as "optical potential" or "many body" approaches, some of which have been quite successful. Another surprising omission from the section on classical theory is the work of Gryzinski and others on the classical impulse approximation.

Volume 2, by Massey alone, is devoted to electron collisions with molecules and photoionization. The first half describes electron-molecule collisions. The format of this part differs somewhat from that of the first volume. There is no division of chapters here between theoretical and experimental. The reason is no doubt the difference in subject matter. Electron-molecule scattering is much more an experimentalist's field than is electron-atom scattering. Volume 2 reflects this. The general theory and specific applications are embedded in the relevant experimental chapters. By far the longest chapter is devoted to experimental results on collisions with specific molecules.

The last two chapters deal with photon scattering and photon-induced reactions. Here again experiment dominates theory, and one is impressed with the immense amount of experimental material presented. An inclusion that is somewhat surprising is a section on bremsstrahlung due to electron coupling with collective modes in a plasma.

These books will probably be most valuable as a reference source for experimental results and techniques. An immense amount of labor must have gone into the compilation.

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Limnology and Productivity

Reservoir Fishery Resources Symposium. Athens, Ga., 1967. American Fisheries Society, Washington, D.C., 1969 (order from R. F. Hutton, executive secretary). viii + 570 pp., illus. Paper, $10.

Including the welcome and the summary, this symposium consists of 40 separate papers. These range from bureaucratic propaganda to highly theoretical discussions of plankton populations. The main burden of the symposium, however, is the limnology of reservoirs, with a good mix of physical and chemical limnology and production ecology.

The rapidly increasing amount of space in the United States being devoted to reservoirs makes the appearance of this book appropriate, if not overdue. The total surface area of reservoirs at the time of the symposium was reported as 8.9 million acres (3.56 million hectares), about equal to the combined area of Connecticut and Maryland. Even the casual observer must be aware of the importance of these reservoirs to flood control, irrigation, shipping, and recreation. Only the initiated would know the extent of the competition among these uses, and the jealous protection of the different interests by the agencies responsible for them. This volume shows a willingness of these agencies now to make accommodation to the other uses. However, the technical language barrier must be broken down before thorough cooperation will be achieved. It is also evident to the reader that each of the professional groups involved has a contribution to make to the development of optimum reservoir management, but there is no clue to how, or by whom, the integration of the efforts of these groups will be achieved.

A substantial segment of this volume is devoted to water quality, how to predict it before impoundment occurs and how to manage it after impoundment. Among the subjects discussed in this connection are the mechanics of stratified flows (Wunderlich and Elder) and the modification of water quality by destratification (Irwin, Symons, and Robeck). The general concern of nearly all the papers dealing with water quality is for fish or fish food production. Several authors attempt to relate environmental factors to fish production (standing crops, or yields), but the lack of uniformity of methodology renders fruitful comparison difficult. It appears evident, however, that dissolved solids, oxygen levels in the hypolimnion, turbidity, level fluctuation, along with area, mean depth, shoreline development, and storage ratio all influence the production of fishes in reservoirs.

Another important segment of the book is devoted to fish populations and the interactions of predatory with nonpredatory populations. Two clear facts emerge from these studies. They are (i) that reservoir populations behave similarly to populations in farm ponds or natural lakes, and (ii) that current methods of assessing population parameters need improvement.

It is probably too much to expect that a first symposium on reservoir fishery resources would be so well coordinated and integrated that it would provide definitive answers to many of the nagging questions about fish production. There exists in this volume a wealth of information on ecologic succession in reservoirs, but the reader will have to make his own analysis of this matter. Several authors mention the well-known history of the early good fishing for desirable species and its subsequent decline. In the aggregate these papers provide physical, chemical, and biological information on this phenomenon, but it is fragmentary and difficult to evaluate. This is a useful reference work, however, and any fishery biologist and especially those working with reservoirs will want to have it at hand for frequent consultation.

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