BOOK REVIEWS


It is not uncommon for foreign works to pass relatively unnoticed for sometime in our country. Van Meel's treatise on phytoplankton is one that deserves more attention by American workers.

From a standpoint of taxonomy alone this work is a fundamental contribution. Provided are records and illustrations for the nearly 900 species and 300 varieties of plankton algae from over 125 genera reported for eastern Africa. From the standpoint of the limnologist the assembled data and tabular data will make the work equally critical. It is a reference tool for future work on freshwater algae of Africa; but because of the large portion of species which are of world wide distribution, it also contributes a valuable reference for American algologists and limnologists.

The first volume consists of three distinct parts: a discussion of the general region and of its lakes; a systematic catalogue; and finally a presentation of limnological data and results of the investigation. The area covered is that along the African rift valleys in which lie the nineteen lakes studied. These extend from Lake Tana at the north in Ethiopia (ca. 12°N. Lat.), southward through Lake Rudolfe in Kenya, Lake Victoria which borders on Uganda and Tanganyika, Lake Tanganyika which borders on the Belgian Congo, Tanganyika, and Northern Rhodesia, southward to include Lake Nyasa (ca. 15°S. Lat.) which projects into Mozambique. This so-called East-African region is discussed in terms of its geology, hydrography, climatic factors, and general vegetation. The individual lakes are described and figured, although particular attention is drawn to Lake Tanganyika where the expedition's work was concentrated. Data and illustrations for this survey were drawn largely from the literature.

Data of especial interest to limnologists are to be found assembled in tabular form in the latter portion of the book. Included are values for dissolved oxygen concentrations, alkalinites, silicates, phosphate, and nitrate concentrations for certain of the lakes. The values are from samples taken at graded depths on indicated days. Van Meel's discussion clearly focuses attention on interesting relationships among the factors and plankton. A number of tables reveal distribution of algal species among the different lakes, among different stations in certain lakes, and in relation to certain factors. Breakdowns are also given for the proportions of different algal classes found at different stations and in different lakes.

A large portion of the main volume consists of the catalogue of species found. Names, synonyms, occurrence in the area, and plate number in the Atlas, are given for all entities listed; whereas additional descriptive data (in French) are provided where new information is being contributed. The comprehensive index to all epithets makes this catalogue especially useful.

The Atlas consists of a collection of illustrations taken from the published works of other specialists such as Hustedt, G. M. Smith, Schmidle, Woloszynska. Whereas no index is to be found in this volume, one can trace figures by means of the comprehensive index provided in Part A.

The works are both beautifully printed with large type and wide margins typical of the entire series. The size, 10 x 13 inches, is somewhat large by American shelf and reprint standards.

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This is the first attempt made in English to gather together and integrate the large and diffuse body of existing information on the physiology of fishes. There is, therefore, a challenge here to each contributor to attempt a most careful appraisal of experimental methods, to sift and organize experimental data, to evaluate results critically, and to attempt to make significant generalizations. Naturally there is variation in the expertise and acumen with which different authors handle their material. Some of the articles in this compendium come close to meeting the high challenge. With one or two exceptions all are competent and thought-provoking reviews. All authors have not followed the editorial suggestion made in the preface to "indicate gaps in knowledge and lines of further research." This is disappointing, for a study of these papers brings into sharp focus the need for better coordination of research, and direction offered by experts in various fields could lead to significant advances in knowledge.

Papers are grouped in two general categories. Volume I bears the subtitle "Metabolism," and
Volume II is subtitled "Behavior," but as the editor points out "the terms are used in a broad sense since most chapters are concerned with both."

Articles in Volume I likely to attract the greatest number of readers are those on aquatic respiration, the cardiovascular system, digestion, excretion and osmoregulation, endocrine organs, reproduction, early development and hatching, and growth. A paper on air breathing discusses pertinent adaptations in those fish which are especially equipped for aerial respiration. Two other papers, "Skin and scales" and "Biochemical composition of fish," complete this volume.

Volume II will appeal particularly to students of physiological mechanisms of behavior. Articles of general interest include one on the nervous system, three on sense organs, three on behavior, and one on color changes. Likely to appeal to special interest groups are the contributions on the swimbladder, electric organs, luminous organs, and physiological genetics. Fish culturalists may be interested in the paper entitled "Water quality requirements of fishes and effects of toxic substances." An article dealing with the biochemical constitution and distribution of pigments in fish is also included in this volume.

Most of these reviews are comprehensive. Authors have been particularly careful to include information about cyclostomes, elasmobranchs, and teleosts. Inevitably, in a collection of papers on closely related subjects the problem of duplication of some material by two or more authors arises. This problem has been handled here with exceptional skill. There is a minimum of repetition, and a system of cross references to various discussions of the same material when they do occur is effectively employed.

An inestimable value to all interested research workers is the careful documentation of source material by most authors. It frequently happens that an individual reference is cited by several authors; readers will be grateful that no attempt was made to save space by compiling a common reference list.

Also to be commended is the fact that detailed knowledge of anatomy of different kinds of fish is not taken for granted. Discussion of the physiology of each organ or organ system is preceded by an appropriate description of the anatomy of relevant structures.

In the opinion of the reviewer the most important single contribution is the paper on the nervous system. In this collection it assumes the central role as a reference work for most of the other papers, for it includes discussions of the nervous control of the different organ systems and of nervous coordination of behavior in the major groups of fishes. The excellence of this article is in keeping with its key position. It is an exhaustive and generally critical review of an extensive literature, full of exciting suggestions for further research.

Particularly outstanding among the contribu-

A curious and deplorable omission from this collection, in view of the fundamental importance of the many and diverse effects of temperature, is a review of the state of knowledge about the temperature relations of fish and of any discussion of temperature perception and responses in fish. Also it may be noted, as a general criticism, that acclimation as a physiological phenomenon is not clearly taken into account and emphasized by most authors. This lack of attention to processes which are of such basic importance in the physiology of fish perhaps reflects the state of the science, for there is as yet insufficient recognition and appreciation of the significance of acclimation mechanisms, although they are likely to become
central problems for future researches in fish physiology.

Today, when the time required to ferret out and read original literature tends to be so great as to interfere with research, authoritative reviews are a necessity. A coordinated collection of reviews of knowledge about different areas of a field is indeed a boon to all workers in the field. In compiling these volumes the editor and contributors have done an invaluable service for all who are interested in fish physiology, not only because they have concentrated and made more accessible an immense amount of information but also because they have advanced the prospect for integration of this information.

These volumes will be of most use to people engaged in research in fish physiology, but many general physiologists engaged in work on other vertebrates will find them valuable as a reference in research and teaching, and may well discover in them many things to recommend fish as experimental animals for their researches.

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