

The typescripts of contributors to this book are reproduced exactly as received, and at the end of each of the discussion provoked by the contribution is recorded verbatim. This procedure is now familiar; and as one who usually fails to start his newspaper at the point the editor considers to be most important, namely at the headlines, I usually read the discussions of such symposia first. Sometimes they instruct and entertain, but occasionally they do neither, as when the dialogue takes the form: "Doctor A: Did you try 'Versene'? Doctor B: No". In this particular symposium, dealing as it does largely with the design and use of apparatus, the discussions have maximum value because few experiences sharpen a scientist's critical powers more keenly than those entailed by the use of an imperfect machine. In the discussion on p. 116, Q. Gibson shows impressive graphs for apparent changes in concentration of a reactant during a reaction time of 0.7 sec; however, the stopped flow apparatus he used contained only distilled water and the measured changes in extinction were due simply to temperature gradients. Such discussions of artefacts and limitations of apparatus add to the value of this book, but there is a lighter side to some of the discussions as the following excerpt shows, taken from p. 269. "Chance: Oh, I thought our chairman would have been content to let sleeping sarcosomes lie . . . Davies: It is not the sarcosomes that lie."

The symposium is divided into two main sections: the first, rapid flow methods, and the second, rapid stopping and sampling techniques. There is a charming introduction to the first section in which F. J. W. Roughton traces the origins of rapid flow methods, and this is followed by four papers on rapid mixing and fluid flow, another four concerned with injection into a fixed volume, two on stopped flow and three on continuous flow methods. The last four papers of the first section relate to non-equilibrium situations created by exposure to a jump in temperature or to a flash of light, including photolysis due to a laser beam. The second section contains fourteen papers dealing with such methods as rapid freezing for interrupting muscular contraction and for metabolite assay in frozen samples of liver; and various pieces of apparatus are described by which it is possible to sample rapidly various systems ranging from yeast cells which are in the process of assimilating phosphate to mitochondrial suspensions metabolizing adenine nucleotides.

All biochemists faced with problems arising from the difficulties of measuring rapidly changing concentrations of metabolites will find sections of interest in this unique collection of papers by acknowledged experts in the field.

S. DAGLEY

¹ Caldin, E. F., *Fast Reactions in Solution* (John Wiley and Sons, New York and London, 1964).

² *Macbeth*, Act 1, Scene vii.

³ Kornberg, H. L., *Biochem. J.*, **68**, 535 (1958).

A WELL-BALANCED ACCOUNT OF THE ALGAE

The Biology of the Algae

By Dr. F. E. Round. Pp. vii + 269. (London: Edward Arnold (Publishers), Ltd., 1965.) 36s. net.

ALL workers on algae, whether phycologists or workers in other disciplines using algae as tools, will undoubtedly be pleased to see an up-to-date text-book on the algae in the English language, particularly when so much information is condensed to give a well-balanced account in such a small volume.

The book contains 13 chapters, copious references and an adequate index. The first two chapters survey morphology, reproduction and life-history and include 10 pages of clear line drawings (an average of 21 drawings to a page) which will help students to visualize the overall picture of the form range in all the algal classes except the Rhaphidophyceae. This is a most valuable contribu-

tion, since only too frequently quite a high proportion of the algal classes are completely ignored for teaching purposes and students are left with the impression that there are only four or five classes of algae. Chapter 3 deals with cytology and genetics including especially the results of the more recent work on ultrastructure; five plates, in addition to line drawings, illustrate this section. The coverage, in the following two chapters, of algal ecology, both freshwater and marine, is well balanced and these sections include, in an excellently condensed form, a great wealth of information.

Physiology is considered at length in Chapters 6-10. The section on culture and nutrition deals with both major and minor elements and organic factors, while the following chapter, on energy sources and pigments, includes up-to-date information on the distribution of pigments in the algal classes. Chapter 8, entitled "Energy Relationships", gives a clear account of recent information on this subject. In Chapters 9 and 10 four subjects—movement, rhythm, polarity and morphogenesis—are adequately covered.

Chapter 11, on fossil algae and the deposition of calcium carbonate and silica, outlines the part that algae have played in geological history. Important data have been admirably summarized in the next chapter on the economic aspects. Here, the importance of algae in everyday life is emphasized by the inclusion of information on the use of algae as food, in agriculture, industry, medicine, sewage disposal, water purification, pollution and land reclamation.

In Chapter 13 the author has endeavoured to present clearly a most difficult subject which is still in a state of flux—algal taxonomy. This chapter has undoubtedly been recast to embody new information on certain classes and therefore there is some lack of agreement between the system of classification presented in Chapter 13 and that used throughout the rest of the text. For example, on p. 9 the class Dinophyceae includes the genera *Exuviaella* and *Prorocentrum*, whereas in the taxonomy section the author follows Fott and puts them in a separate class (p. 239), the Desmophyceae. Four points in this section should be noted: (a) the ending for a sub-division—phytina should be included in the list of endings (p. 227) as sub-divisions are used afterwards (pp. 235, 238); (b) the ending for a sub-order should be -inales, not -inales (p. 227); (c) under Eucaryota seven phyla and one class are indicated (p. 230), but only seven phyla are dealt with, so presumably the Rhaphidophyceae (chloromonadines) must be the class lost by the wayside; (d) in the division Chrysophyta the first paragraph (p. 231) has not been revised to cover the modern concept of this division, since the author speaks of three classes whereas in the following pages he includes four classes in this division.

In spite of some minor defects this book will be most helpful both to phycologists and to workers in other fields. Its users will appreciate the enormous amount of information on methods given in the various sections; they will also find many suggestions for research problems incorporated, since the author has also indicated very clearly the gaps in our knowledge of the algae. Some misprints occur, mainly among the generic and specific names, but these are not serious. There are a few mis-statements, but these are not likely to mislead. For example, certain references to Fig. 14 on pp. 46-47 should read Pl. 4B and on p. 138 the author speaks of *Ilea* and *Actinococcus* being present around the St. Lawrence and the Bay of Fundy but being absent from the British coast. The *Ilea* = *Petalonia fascia* and *P. zosterifolia* and the *Actinococcus* = the nemathecium of *Phyllophora brodiaei*, all of which are recorded for the British coast.

This book is exceptionally good value for money, the illustrations are attractive and instructive, and Dr. Round is to be sincerely congratulated on the production of his book which satisfies a long-felt need.

MARY PARKE

G. T. BOALCH