CULTURING ALGÆ AND FLAGELLATES

Pure Cultures of Algæ

Their Preparation and Maintenance. By E. G. Pringsheim. Pp. xii + 119. (Cambridge: At the University Press, 1946.) 7s. 6d. net.

THIS little volume comprises a letterpress of only a hundred pages, yet brings together results of more than thirty years of experience of cultural work of freshwater Algæ and Flagellata, much of which was carried out in Germany and is made for the first time easily accessible to the English reader. The portrait of Beijerinck as frontispiece reminds us of the work of one whose name is not always associated in Britain with algology. Eight other illustrations in the text illustrate effectively simple practical devices found to be useful in preparing, handling or maintaining cultures.

Most of the book is concerned with the principles underlying the methods most likely to be successful in culturing Algæ and flagellate unicellular organisms. These differ in several respects from those already well known for Fungi and Bacteria. In the majority of algal cultures, for example, the medium must be near neutrality, mineral salts must be given in considerable dilution and organic nutrients avoided owing to the danger of undue development of bacteria or other unwanted organisms. Wittepeptone, so often used for Fungi, seems to be contra-indicated for almost all Algæ. The important distinction is made between uni-algal (not necessarily bacteria-free) and 'pure' cultures, which contain only the one organism selected. The former are sufficient for many purposes and are much more easily obtained in most cases.

More specific directions with regard to culturing on agar and sub-culturing in soil-water liquid media are given for certain groups in Chapter 8, but even here the information is rather generalized in character.

Dr. Pringsheim has himself made a great advance in establishing pure cultures of many green Algæ, thus making possible a much more systematic study of the living forms. These cultures are available to anyone at moderate price, and will doubtless be in demand as they become more known. The reviewer had occasion to send for some of them. They grew well for a time, but no indication was given as to the nutrients used in the agar slopes, as is usual (and helpful) in standard fungal cultures. Indeed, in view of the frequent reference in the text to the variety of media available and the scattered nature of the literature in which these are recorded, it would seem worth while to have included for easy reference an appendix with a few specific formulæ of proved merit, giving the particular organisms with which they were successfully used. It is true that we are warned (p. 32) that "the precision advocated in many recipes is apt to be misleading" and that changes brought about in the medium by the organisms themselves may be of the first importance, but a formula gives at least a definite starting point, and it is only by a comparison of definite records of the formulæ, the manner of their utilization and the results obtained that the essentials may be discerned.

The author hopes to establish "a small research station" devoted to the study of Algæ. Perhaps, for a time, something of the kind might be attached to some existing or future botanical institute, but there is certainly a wide field for investigation.

The foreword by Prof. Fritsch is a most appropriate introduction to this pioneer work. Author and publisher are to be congratulated on the format and typography, which combine to make this a very pleasant little book of reference. E. M. DELF

ELECTRIC DISCHARGE LAMPS

Electric Discharge Lamps

By Prof. H. Cotton. (Monographs on Electrical Engineering, Vol. 12.) Pp. xvi + 435. (London: Chapman and Hall, Ltd., 1946.) 36s. net.

DURING the last fifteen years electric discharge lamps have been developed to an extent which makes them now a commercial product of the first importance. Uytendaele published an excellent survey of the subject (Julius Springer, Berlin, 1938), but there is no English translation and his book is already partly out of date. Prof. Cotton's book, the first in the English language, is therefore to be welcomed. It has been written mainly with the requirements of the electrical and the illuminating engineer in mind.

About two thirds of the volume are taken up with fundamentals necessary to an understanding of discharge lamps. Thus radiation and thermionic emission receive brief treatments; the structure of the atom and atomic spectra occupy some ninety pages; discharge phenomena and the motion of particles in the discharge are dealt with in two chapters totalling some sixty pages. There are also chapters on fluorescence and on colour and its assessment. The discussion of discharge lamps themselves and the problems involved in their operation occupy two chapters totalling 175 pages, or considerably less than half the total book.

That so much space is concerned with material preparatory to dealing with the lamps themselves raises an interesting question. In many books, a large part of the space is occupied with elementary discussions of fundamentals easily to be found in other places. This is not necessarily a fault, for it is useful to have the subject more or less complete between one pair of covers. Proper balance should, however, be maintained, and there would seem to be two criteria as to whether the practice is justifiable: the material should be restricted to that which clearly relates to the main subject, and its treatment should be concise and should bring out strongly the principles which are actually required. Prof. Cotton could have been more successful in this respect than he has been: more could be said in less space if the important aspects of the fundamental treatment were stressed and unnecessarily lengthy discussion curtailed. As an example: an elementary understanding of spectra in electric discharges does not need the long discussion in Chapter 8 on elliptic orbits; and after this long discussion, the reader will still probably be puzzled to know how the separation of the *s*, *p* and *d* levels is to be accounted for. There is moreover, throughout the book, a fair number of mistakes and some confusion, although fortunately not of the kind which will seriously worry or mislead the type of reader for whom the book is intended.

However, after these criticisms, there is still much to be praised. Prof. Cotton has conscientiously collected and presented most of the available informa-