

narrowed the range of disinterested argument to limits within which a broadly satisfactory solution could be reached if the Government would give a lead. Nor is it a matter which is a party issue. It will augur ill for the future of democracy if, even in the present circumstances, the Government refuses the opportunity of effecting a reform which could bring new life and interest just where it is most needed to give real meaning to democracy and freedom. Once local government and local democracy become ineffective, other groups, such as the professional associations, are unlikely to find that they can for long provide the means for the individual to contribute effectively to the great task of government, or that the atmosphere of freedom in which they thrive and do their most creative work will long survive.

PHYSIOLOGICAL FOUNDATIONS OF MYCOLOGY

Physiology of Fungi

By Dr. Lilian E. Hawker. Pp. xvi+360+5 plates. (London: University of London Press, Ltd., 1950.) 21s. net.

WITHIN every problem of fungal ecology is embedded a problem of fungal physiology. Mycologists have become diverse and specialized in their particular interests; but none can afford to neglect the unifying discipline of physiology. It seems all the more remarkable that, until recently, no text-book of general fungal physiology was available, nor had anyone produced even a comprehensive modern review article to fill this gap. In 1947, F. A. Wolf and F. T. Wolf made a courageous attempt to supply this need in the second volume of their text-book "The Fungi". Ranging widely over the fields of fungal physiology, biochemistry and ecology, these authors were unable to do full justice to the great volume of work published on fungal physiology alone. Jackson W. Foster's "Chemical Activities of Fungi", published in 1949, is exceedingly comprehensive within the restricted scope defined by its title; but many aspects of fungal physiology have been deliberately excluded from consideration by this author. It has thus been left to Dr. L. E. Hawker to produce the first truly comprehensive work on the physiology of fungi, and she has rendered thereby a signal service to all mycologists.

This book owes not a little to the environment that has nurtured it, the Department of Botany at the Imperial College of Science and Technology, London, as Dr. Hawker has indeed acknowledged in the tribute she pays to Prof. William Brown in her preface. As a fungal physiologist and pioneer investigator of the physiology of parasitism, with which his name will always be specially associated, William Brown occupies a unique position, in the acknowledgment of which Dr. Hawker has placed in her debt a host of Prof. Brown's former research students, for many of whom this association has been deeply significant for their subsequent output. It will always be regretted that Prof. Brown did not find time to write such a book himself; but let it be said at once that upon none of his former associates could the cloak of Elijah have descended more fittingly than upon Dr. Hawker, who is well known for her

own distinguished researches on fungal physiology, particularly with respect to growth factors and carbohydrate metabolism.

Although biochemists have become increasingly interested in the physiology of fungi and other micro-organisms, as much as ever yet awaits investigation in the field of gross fungal physiology, which still remains the proper sphere of the mycologist as such. As Prof. Brown remarks in his foreword to this book: "In the last resort, the greatest scientific interest concerned lies in the functioning of the organism as a whole". This book presents, in fact, a study of the whole fungus in relation to the whole of its environment, and it comprises a body of knowledge which is essential for any mycologist who has to manage fungi as living organisms. The comprehensive scope of this work is indicated by the chapter headings: following upon the introduction come chapters on growth and variation, nutrition, respiration and fermentation, effect of nutrition on sporulation, other environmental factors affecting growth and reproduction, survival and germination of spores, and interaction, including parasitism, with other organisms.

Such criticisms as can be made relate chiefly to errors of omission, which may be ascribed in part to a prolonged gestation in press. Aeration of culture solutions and the shake culture technique, which have been exhaustively discussed by Foster, are barely mentioned here. It seems unduly conservative to dismiss these new techniques, together with the perfusion technique, as not "practicable on a large scale in the average laboratory" (p. 21). The replacement culture method for dissimilation studies is not mentioned.

Apart from such relatively minor gaps, this book has been admirably planned and executed, and is singularly free from typographical and trivial errors. It is not easy to produce a standard work of reference; it is still more difficult to reduce such a mass of data as Dr. Hawker has had to handle to a text that can be read straight through without effort. This second objective, unperceived, rejected or abandoned in despair by more prolific writers, has also been achieved by Dr. Hawker, and this is not the least part of her success in the production of a very useful and timely book.

S. D. GARRETT

SPACE-TIME STRUCTURE

Space-Time Structure

By Erwin Schrödinger. Pp. viii+119. (Cambridge: At the University Press, 1950.) 12s. 6d. net.

SCHRÖDINGER shares with Einstein the belief that there must be a natural generalization of the relativistic theory of gravitation which could serve as a secure base for dealing with all other natural phenomena: electro-magnetism, meson fields and their interactions. Einstein himself has given a short account of his ideas in a little book, "The Meaning of Relativity", which I have reviewed in *Nature* (166, 751; 1950). In fact, the two books by Einstein and Schrödinger have a common background of conviction and method; their aim is the same. But otherwise they differ thoroughly. Einstein's book discusses the idea of a unified theory only in a brief and condensed appendix, while the main text (a revised version of his Stafford Little Lectures of 1921, published 1922) is a rather elementary account of special and general relativity which can be recom-