

invertebrates, and sets the alternatives before the student without taking sides. Classification within the Nematoda on which there is also disagreement among taxonomists is unfortunately omitted. An outline of the two principal systems down to, say, the level of the superfamily would have helped the student to understand the relationships of the groups referred to in later chapters. Some misstatements in the text should be mentioned. On page 19: "Lateral fields are the result of incisures [lines] that run the length of the body on the lateral surface" and, three lines down, "Some nematodes lack lines in the lateral field". On page 88, the structures of the vulval cone of *Heterodera* cysts are misinterpreted and it is a pity that Cooper's 1955 paper which first described and proposed names for these structures is omitted from the references. The root-knot nematodes have never been included in the genus *Anquillulina* or *Ditylenchus* (page 100). The nineteenth chapter (on *Xiphinema* and *Longidorus*) appears inadequate in the light of recent work on these genera and there is barely a mention of their important role as virus vectors, though this is discussed briefly in the fourth chapter.

The line drawings are the work of one artist; they illustrate a hypothetical representative of each genus and occasionally include typical morphological variations. It is difficult to see any advantage of this method over the more conventional one of illustrating a representative species—either way interspecific variability must be reckoned with. Several inaccuracies in the figures were noted, for example, *Ditylenchus* is shown with a rounded spermatheca though none has been described, *Xiphinema* is poorly figured with ovaries reflexed in the wrong place, and *Plectus* (Fig. 21 : 2) lacks its characteristic gubernaculum and cephalic setae. The drawings, however, are mostly clear and uncluttered by needless detail, and the use of uniform conventions for representing different organs facilitates comparison between genera. Some half-tone figures suffer from not being on art paper and Fig. 10 : 2 gives poor illustrations of the damage caused by *Ditylenchus dipsaci*.

The book's prime concern is with principles, in the control chapters as well as elsewhere. The authors believe that it will be useful to plant pathologists and extension specialists as well as students, but Thorne's textbook, the Ministry of Agriculture's two technical bulletins on nematology or the recent FAO handbook by A. L. Taylor, depending on location, are probably of more value to them. "Jenkins and Taylor" should become a valuable first text for budding nematologists, and essential reading for students of agricultural zoology and parasitology, especially with the improvements that one may expect from future revisions. In spite of shortcomings in matters of detail, the book is basically sound, objective in its approach and reasonably free from geographical bias. It is well but not sumptuously produced (considering its cost) and typographical errors are rare. It would be a pity if its high price put it beyond the reach of many for whom it is intended. I would therefore make a strong plea for a cheaper edition as soon as possible.

J. F. SOUTHEY

PALM DISORDERS

Diseases and Disorders of the Oil Palm in Malaysia

By P. D. Turner and R. A. Bull. Pp. iv+247. (Kuala Lumpur: The Incorporated Society of Planters, 1967.) n.p.

THE result of experimentation on diseases of tropical crops is so dispersed in the literature that it is extremely difficult for field or plantation workers to obtain relevant information on their problems. The authors have reviewed in this book the up to date information on diseases of oil palms and have drawn on their personal

knowledge of such problems in Malaysia and West Africa.

We are told in the preface that this book is intended as a descriptive text and one can only commend the detailed treatment of the sixty-two major and minor diseases and disorders to which the oil palm is prone in Malaysia. As such it will be invaluable not only to the members of the planting community but also to research workers interested in oil palms.

Much information is also given on the role of cultural practices in the plantation and the authors have rightly pointed out that many diseases are of a secondary nature and that the real cause lies in poor husbandry. In this era of liberal fungicide and insecticide treatments it is perhaps salutary to be reminded of the rewards of being a good farmer.

The text conveniently deals with diseases and disorders of the nursery first and follows on with those occurring on young and mature palms in the field. The cause of many of these disorders is apparently unknown and this serves to emphasize the need for more research in this field.

The authors have had the foresight to include descriptions of diseases which are of economic importance elsewhere but which have not yet been recorded in Malaysia.

All the major and most of the minor diseases and disorders are illustrated in colour and the quality of the reproduction of disease symptoms is generally good. A few, however, do not represent quite so true a picture and therefore might be misleading.

It is unfortunate that the excellent presentation of this book should be marred by such a long list of errata.

J. S. ROBERTSON

CONTINUOUS FERMENTATION

Microbial Physiology and Continuous Culture

Edited by E. O. Powell, C. G. T. Evans, R. E. Strange and D. W. Tempest. (Third Symposium held at the Microbiological Research Establishment (Ministry of Defence), Porton Down, Salisbury, Wiltshire.) Pp. viii+261. (London: HMSO, 1967.) 60s.

MODERN studies on the growth of micro-organisms have followed the work of Monod^{1,2}, which he developed into a study of continuous growth³. This eventually led to a series of international symposia, the first in Prague⁴ and the second in London⁵. The present volume, the record of the third symposium, held in 1966 at an appropriate location, places the emphasis on the interdependence of microbial physiology on practical continuity and the use of continuous culture in studying microbial physiology.

The volume has eight sections. In the first section Academician I. Malek surveys the present state and development of continuous culture since 1958. In the second section A. C. R. Dean compares bacterial growth (cell size and composition—RNA, DNA and protein) in batch and turbidostat; N. D. Jerusalemky deals with metabolic bottle-necks, for example reactant concentrations, as growth rate controllers; E. O. Powell examines growth and substrate concentration mathematically, and the section concludes with editorial comment on endogenous metabolism (rate of consumption of their own mass) and maintenance coefficient.

The third section examines individuals more closely; K. Beran *et al.* discuss the distribution of the relative age of yeast cells in populations (using "simple" fluorescence microscopy for determining bud scars), and J. F. Collins discusses variation within bacterial populations (in relation to the distribution of penicillinase in induced and uninduced *Bacillus licheniformis*).

A further section considers the detailed role of magnesium: D. Kennell considers nucleic acids and protein metabolism (with precautions in magnesium-starved