

## PLANT CUTICLES

### The Cuticles of Plants

By J. T. Martin and B. E. Juniper. Pp. vii + 347. (Arnold: London, March 1970.) 150s.

UNTIL recently there has been a relatively small literature available on the anatomy, chemistry and function of plant cuticles. By contrast there is a voluminous literature dealing with the holes that occur in cuticles because studies of the factors that affect the opening and closing of plant stomates have long been a favourite topic for investigation. With the development of the technique of gas chromatography, the availability of commercial electron microscopes, and the discovery of the procedures of freeze-etching and carbon replica formation, it is now possible to make intensive studies of the waxy cuticles of plants. This is currently an active research area and the authors of this book are to be congratulated on preparing a good book at the right time.

The combination of a chemist and a botanist has resulted in a wide cover of the literature because they have listed more than 1,000 references that impinge on their subject. For some, possibly too much emphasis has been placed on experimental methods, especially in the early chapters, but for others these chapters will be an invaluable source of references. There are few significant omissions; possibly the physics behind cuticular resistance to water vapour loss could have been better developed, and information on the actual magnitude of the resistance values could have been given in view of the great importance of the plant cuticle in controlling desiccation. Mention might also have been made of "chemical pruning agents" used in floriculture to kill selectively terminal meristems because these compounds almost certainly exert their effect due to the differences that exist between the cuticles of young and old tissues. A surprising inclusion is the interesting but relatively inaccessible work on the waxy cuticles of *Eucalyptus* sp. taken from an unpublished PhD thesis by Hallam.

I particularly like the introductory paragraph at the start of each chapter to help orientate the reader for what is to come. The cross-references within the text, the table of binomial and vernacular names and the glossary are also helpful. There is no tendency for the authors to simply tabulate a sequence of research findings as, throughout, current thinking has been summarized and presented as well-digested arguments.

I believe that the stated objectives of the authors in writing a book "of interest to all plant biologists and especially to workers in plant physiology, plant pathology, crop protection and to university, college and school teachers" although a rather large task has, in the main, been achieved. Finally, the publishers are to be commended for the high technical quality of the book; in particular, for the eye-catching dust cover, for the use of glossy paper throughout and, especially, for the high quality of the reproduction of electron micrographs, as carbon replicas of wax surfaces notoriously lack contrast. There is every chance that this book will become and will remain the standard reference on plant cuticles for quite some years to come and, as such, represents good value for money.

J. V. POSSINGHAM

## HANGERS-ON

### The Biology of Parasitic Flowering Plants

By Job Kuijt. Pp. 246. (University of California Press: Berkeley, Los Angeles and London, November 1969.) 143s.

PARASITIC flowering plants occupy a significant place in the flora of the world and in the agricultural economy of many tropical and sub-tropical regions, yet they form the one group that has been sadly neglected from the point of view of a unified presentation of the accumulated knowledge.

This book succeeds in filling this gap by surveying the whole field of parasitism by higher plants, from the lowly hemiparasite to the almost science fictional existence of *Rafflesia* and its relatives. Every aspect of the biology of these plants receives some attention.

An introductory chapter gives an absorbing account of the discovery of parasitism and the folklore, uses and medical and magical properties of parasitic plants. The author then allocates a chapter to each of the principal groups of parasitic flowering plants and makes a detailed examination of their important families and genera. The groups considered are the mistletoes; the sandalwoods; the broomrapes and figworts; the Rafflesiaceae, Hydnoraceae and Balanophoraceae—the families with relatively large parasitic complements; and *Cuscuta*, *Cassytha*, Lennoceae and Krameriaceae—isolated parasitic genera and families with few parasitic species. For each family the patterns of and variations in embryology, seed structure and germination, flower structure, fruit structure and dispersal, and the habit and mode of parasitism are described. These descriptions are illustrated by many excellent line drawings, mostly drawn by the author from material in the herbarium of the University of California, Berkeley. The half-tone illustrations, however, lack clarity on the matt paper, and many of them should merit special treatment in a book costing as much as this one.

Subsequent chapters deal with the structure of the haustorium, and the physiological and evolutionary aspects of parasitism. The foremost of these chapters describes the development and structure of the absorptive organs of the parasites, by which nutritional contact with the host is made. The author puts forward, in this chapter, a comparative account of haustorial structure. Absorptive organs are described, from the simple haustorium of the unspecialized root parasites, through the intricate haustoria of the specialized holoparasites, to the mycelium-like endophytic systems of the Rafflesiaceae. He concludes that, although the parasites display a marked degree of evolutionary plasticity in this respect, the haustorium of parasitic angiosperms represents a root in function and evolutionary origin. The physiological aspects of parasitism considered are germination and the exudation of germination stimulants by the roots of potential hosts, the nutrition and water economy of parasites, host ranges and the effects of parasites on their hosts. The final chapter discusses the possible evolutionary pathways of parasites and the relations between the structure of parasites and their evolutionary position.

The noticeable predominance of structure over function in this book is a reflexion not only of the author's research interests but also of our lack of knowledge in the fields of the physiological and nutritional aspects of parasitism and host relations.

The bibliography of some 700 references and the very detailed index combine to complete a book which is very readable and a long awaited reference book in this fascinating aspect of botany.

R. N. GOVIER

## FOULING OF AN ESTUARY

Effects of Abatement of Domestic Sewage Pollution on the Benthos, Volumes of Zooplankton, and the Fouling Organisms of Biscayne Bay, Florida

By J. K. McNulty. (Studies in Tropical Oceanography, No. 9.) Pp. 107. (University of Miami Press: Florida, 1970.) n.p.

A STUDY of the ecological effects of pollution has to be comparative; unfortunately, by the time it becomes clear that such a study is needed, it is usually too late to observe the unpolluted condition. Dr McNulty has taken an unusual opportunity to make such a study in reverse.