greater influence on vegetation than is generally recognized, and Miss J. Turner examines the use of pollen analysis of several profiles in one site to locate local forest clearance and separate it from regional patterns.

Two essays deal specifically with Professor Godwin's interest in the history of the British flora. The essay by Professors G. F. Mitchell and W. A. Watts brings together and discusses knowledge of the history of the Ericaceae in Ireland and of the rarer Irish species in western Europe. Miss A. P. Conolly and Dr E. Dahl present a detailed analysis of the distributions of arctic-alpine and montane species of flowering plants in Britain in relation to the estimated mean maximum temperatures on the summits of the highest hills. This is an extension of Dahl's earlier work in Scandinavia. Where a particular species occurs, the correlations are often remarkable, but many species fail to appear in large areas where summer temperatures seem to be suitable. Why is *Arctostaphylos* not in Wales or on the moors of Devon and Cornwall? Is it not a little worrying that this plant should favour the warmest south-westerly exposures in most of its English localities and grows in profusion on sunny slopes in the Cevennes associated with *Buxus sempervirens* and *Helleborus foetidus*? Dare one suggest that if summits more than 3,000 feet above sea-level or corries above 2,500 feet were plotted on a map they might also be correlated with particular limits of mean maximum summer temperature? One is left with an urgent desire to do some experiments with the plants themselves. C. D. PIGOTT

PLANT CHEMISTRY

Organic Chemistry of Secondary Plant Metabolism

By T. A. Geissman and D. H. G. Crout. Pp. ix+592. (Freeman, Cooper: San Francisco, 1969.) n.p.

A NUMBER of books similar to this have appeared during the past 5 to 6 years, and although there is nothing excitingly original in this new volume it can be fully recommended. It is well planned, attractively presented, covers a wide field and is relatively free from errors. It represents a solid achievement which will be of great value to the increasing number of organic chemists taking an interest in problems of biosynthesis. It will also appeal to biochemists, not only because of the information provided but also because the biochemical difficulties inherent in biosynthesis are more fully appreciated than they are in some other texts. Indeed, in chapter two the authors give an outline of the biochemical activities which provide the primary building stones for the formation of the complex natural products they discuss. This chapter should be read in conjunction with a biochemical text.

The authors have, on the whole, achieved their claim that "the general principles of chemistry of natural products" have been described "upon which students may build a more detailed and extensive familiarity with one or more of the individual classes that make up the compounds of Nature". From this point of view, the chapters on flavonoids, oxidative coupling of phenols and alkaloids are particularly successful. The chapters on terpenoids are satisfactory as far as they go, but they seem to be less up to date than many of the other chapters. It was unfortunate that in a book whose preface is dated April 1969 it was not possible to mention the discovery of squalene 1,2-oxide as the precursor of triterpenes, or to discuss the basic stereochemical investigations on sterol biosynthesis initiated by Conforth and Popják.

One of the pleasures associated with this book is that almost every time one opens it some statement or comment sets one off on a new line of thought. I, for one, am grateful to the authors for taking the time and trouble to set out in this book their considerable knowledge of and insight into this fascinating field of chemistry. T. W. GOODWIN

TERMITE SOCIETY

Termites

A Study in Social Behaviour. By P. E. Howse. Pp. 150+4 plates. (Hutchinson University Library.) (Hutchinson: London, March 1970.) 35*s* boards; 15*s* paper.

THE behaviour of social insects is perhaps too often described in terms of the life of the honeybee. The appearance of an introductory book on termite biology is therefore welcome; as the author says in his preface, many undergraduates know termites better as the home of symbiotic protozoa than as insects. There are disadvantages, however, in approaching sociality in insects through the termites (or for that matter through ants or wasps). The varied life histories of different species compound the complexity which already exists in the life of a single species, and this becomes more serious still when the patchiness of research makes it necessary for discussion to skip from one species to another. Termites are even more tropical in distribution than other social insects and, as a result, have attracted less investigation, except perhaps of an economic kind. Lastly, the developmental stages obtrude more into accounts of social biology in termites than in Hymenoptera; probably most readers will have to turn backwards or forwards to the tables of developmental stages rather frequently.

Dr Howse has been quite successful in meeting these problems. After two slightly repetitive chapters on the habits of termites and elements of termite society, he deals with three aspects of termite life: the swarming and mating of sexual forms, communication by sound and scent and the form, and to a smaller extent the functions and construction of nests. Clearly in some other areas our knowledge is very small; termites are, after all, subterranean and cryptic animals. A more detailed account of tandem formation and of food exchange should, however, have been possible.

The final chapter discusses the relation of some general views of animal behaviour to the social behaviour of insects. This too is successful as far as it goes, but the fact is that our knowledge of the behaviour of termites is at present inadequate for the production of concepts, at least at the "physiological" level which Dr Howse (and I) favour.

The book is adequately but not copiously illustrated, though some illustrations have been marred by over-reduction in size. There are some 170 references and an index. This book can be recommended as a welcome source of information for undergraduates, and others, who are interested in behaviour or entomology.

J. H. SUDD

FISH IDENTIFICATION

Diagnostic des Pièces Rachidiennes des Téléostéens et des Chondrichthyons

1 Gadides. By Georges Desse and Marie-Henriette du Buit. Pp. 71. (Le Expansion Scientifique: Paris, 1970.) n.p.

IDENTIFYING isolated fish vertebrae is a difficult task, even when good collections of comparative material are available. Thus, one should welcome the publication of this new series whose aim is to provide diagnostic characters for identifying vertebrae to the species level.

The first volume is a short, largely pictorial account of various vertebral characters in fourteen species of cod-like fishes from north European seas. The authors have worked out a system of identification based on ossification patterns in the centra, visible externally or in transverse section. The patterns are illustrated by photographs and somewhat schematized line drawings. There are also radiographs (mostly in frontal section) of each element in the entire vertebral column. These are intended to supple-