

service by suggesting that ecology is superficial and that generalizations are acceptable. I wish Mr. Sankey had decided to concentrate on the question "why" even if this meant he left out the "what". For modern ecology is excitingly experimental and analytical, and chalkland is one of the best regions to discover this.

A. D. BRADSHAW

ALPINE BUTTERCUPS

The Alpine *Ranunculi* of New Zealand

By F. J. F. Fisher. (Bulletin 165.) Pp. 192. (Wellington: Botany Division, Department of Scientific and Industrial Research, 1965.) 70s.

DESPITE its relatively small size, New Zealand is one of the major areas of diversification of the buttercups (*Ranunculi*) in the southern hemisphere. Nearly half the native species occupy alpine or sub-alpine habitats and are large flowered and beautiful plants. Hitherto, their identification has been beset with difficulty, partly on account of their plasticity with change of habitat and partly because numerous hybrids confuse the specific boundaries. The unravelling of this complex of intergrading forms was a formidable task on which Dr. F. J. F. Fisher has brought to bear all the techniques of modern experimental taxonomy. The basic field work necessary for the successful conclusion of his study must have entailed many arduous journeys into the New Zealand alps. The field work was supplemented by the cultivation of transplants in an experimental garden, where the breeding relationships were studied and chromosome numbers determined. Fisher has made much use of leaf characters, especially of the general shape and lobing, which in the past have been regarded as too variable to be of much value. When the underlying regularities have been mastered they can be turned to good account, and leaf shape interactions then provide valuable evidence on hybrid intergrades. A full page distribution map is given for every species, accompanied by leaf outlines related to different parts of the range of the species. The general trends of leaf shape clines are thus effectively demonstrated. The systematic revision provides a description of each species with a discussion of its hybrids and is illuminated by excellent line drawings contributed by Mr. K. R. West. The several factors contributing to variation are critically evaluated for each group of species and finally are integrated into a phylogenetic scheme. An initial dichotomy into many petalled and few petalled races is postulated, followed by migration and counter migration influenced by the climatic changes of the Pleistocene. Cold periods drove the alpins down into the valleys, allowing intermingling of populations and hybridization to take place. In milder intervals the plants retreated up the mountains into relative isolation, which favoured further speciation. A convincing and highly dynamic picture of the evolution of the group results. Dr. Fisher is to be congratulated on an outstanding piece of research which for content, interest and method of presentation may long stand as an example to others in the field of experimental taxonomy.

R. MELVILLE

SMELLS

Odour Preferences

By R. W. Monerieff. Pp. 357. (London: Leonard Hill, 1966.) 90s.

THE factors affecting human and animal odour preferences are complex and varied. Using results from a wide variety of tests the author has attempted to survey the theoretical and practical aspects of this subject. The result is a volume which makes interesting reading and which contains a mass of information.

The first section of the book analyses the preferences of twelve people who were presented with 132 different smells ranging from flowers to chemicals. The effects of age, sex and temperament on preferences are examined and discussed in detail.

The second part of the book discusses the preferences of a wide range of people, about 500, towards ten dissimilar odours ranging from strawberry essence to oil-soluble chlorophyll. Here again, variations in preference with sex, age and temperament are very fully analysed, and the reproducibility of these preferences is assessed.

The third and final section of the book assesses the findings against prior knowledge. The psychology of pleasantness and unpleasantness, effects of association, adaptation, habituation and racial characteristics are discussed. There are short summaries of recognized systems of odour classifications, odour preferences in animals and olfactory preferences in foods. The concluding sections deal with perfume preferences and the use of perfumery in industry.

At first sight, there is too much tabulation and analyses of the experimental results recorded in Parts 1 and 2 of the book. The evidence in support of some of the conclusions is rather thin and would not satisfy the statistician, but this is a good attempt to deal with a very difficult subject. The list of very varied references given with each chapter is particularly valuable.

J. H. MAYO

SKILL

Acquisition of Skill

Edited by Edward A. Bilodeau. Pp. xiii + 539. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.) 100s.

SENSORY-MOTOR skills are basic ingredients of human activity, and their importance becomes all the greater as man continues to amplify his limited capabilities by devising increasingly complex machines. So it is not surprising that the past quarter century has seen considerable research into the properties of such skills and into the ways in which they are acquired. Despite its title, this book does not attempt to produce either a coherent overview of skills research or a handbook concerned with practical training problems. Rather, it is addressed to experimentalists who are interested in current theoretical issues related to laboratory studies of skill. The book is the outcome of a research conference held in 1965 at New Orleans and contains contributions from ten principal authors and eight others. The contributors are all well known workers in the area of skills and all but one are American. Here, they produce a close-packed wealth of recent material on aspects of, among other things, selective learning, individual differences, facilitation and interference, information feedback, tracking behaviour, cybernetic theory, and relations between motor skills and rote verbal learning. The book contains much to interest those who are concerned with current research and theory about sensory motor skills. Its value is enhanced by careful editorial work and the inclusion of several useful up to date bibliographies.

I. M. L. HUNTER

Sequences

Vol. 1. By H. Halberstam and K. F. Roth. Pp. xx + 290. (Oxford: Clarendon Press; London: Oxford University Press, 1966.) 63s. net.

ALTHOUGH the title of this book may be misleading, the reputation of the authors as experts in the theory of numbers implies a collection of interesting and important number-theoretic results on certain classes of sequences of integers. More than half the book is concerned with general results relating to the addition of sequences.