

BOTANY

Vascular Plant Families

By James Payne Smith, Jr. 1977. Mad River Press, Inc., Route 1, Box 151-B, Eureka, California 95501. 320 pp., illus. \$9.55.

Students and teachers of plant taxonomy alike will welcome this elementary book which contains everything from an outline of the taxonomic hierarchy and scientific names, through family descriptions, lists of regional floras for the United States, notes on how to collect plants, to a useful glossary.

Following the system of Cronquist, Takhtajan, and Zimmerman (1966) for divisions, classes, subclasses and orders, and Cronquist (1968) for the sequence of families, the author presents "an introduction to the families of vascular plants native to North America, and selected families of ornamental or economic importance." This introduction consists of short descriptions of the families, an indication of the number of genera and species, a few selected genera,

some recognition characters, and a floral formula. Over one hundred plates of fine line drawings by Kathy Simpson accompany this text. Of special interest to the student is the chapter entitled "Vegetative morphology of the flowering plants." This is an illustrated glossary which is divided into sections that give the terminology used to describe various parts of a plant and their arrangement, e.g., roots, stems, leaves, etc.

The book is written for students by a teacher who has tried to present his subject as simply as possible. The elimination of all but a few of the non-North American families has certainly made this easier. The author is to be congratulated on a job well done!

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An Atlas of Airborne Pollen Grains and Common Spores of Canada

By I. John Bassett, Clifford W. Crompton, and John A. Parmelee. 1978. Agriculture Canada, Ottawa. 350 pp., illus. \$12 in Canada; \$14.40 elsewhere.

This attractively and robustly bound research monograph represents the culmination of over two decades of careful, well reported investigations by the authors into the problems of airborne allergenic pollen and spores. It is addressed to workers who wish to identify airborne pollen and spores because of their interest in either allergy problems, or in general and applied palynology. Its effectiveness therefore should be measured by the clarity and quality of the illustrations; the rigor and decisiveness of the keys; and the degree to which it will become indispensable to the laboratory scientist in the appropriate disciplines. But its format implies a wider readership target.

The first 39 pages introduce the subject of allergy pollen. They vary from a few fascinating pages (15-16), to some dreary tables (16-39), which should be appendices. Pollen grains are exciting objects. A lively up-to-date chapter on their development, role in reproduction, life-cycle strategies, paleoenvironmental reconstructions, etc., as well as a more animated discussion of the intriguing material on p. 13 on diurnal patterns and the spectacular data on the decline of ragweed fallout since the 1950s might have captured a wider readership. And what about allergic

reactions to pollen? Couldn't we have had a few pages summarizing the state of the medical arts on that?

We are plunged into the dichotomous identification keys to pollen, the heart of the book for the user. Presumably, the user will be the technician in the allergy laboratory, because other pollen work deals with ranges of material incompletely covered in this book.

Pollen keys at best are unsatisfactory and they are usually fully comprehensible and usable only by the authors themselves. The keys in this book are useful but uneven. For example, the distinctions between important species (*Fagus*, *Quercus*) are not clearly handled. *Comptonia peregrina* is not consistently tetraporate, as Figure 107 C and D demonstrate, and in fact is indistinguishable from *Myrica*. On the other hand *Alnus* could be separated readily to species, if it were useful to do so from the allergy viewpoint.

The photomicrographs are of very uneven quality. Some taxa have no light microscope photographs (*Carex*), others have interference and SEM but no non-interference light microscope illustrations though they are essential (e.g., *Fraxinus*, *Luzula*, *Triglochin*, *Zea*, and others). The magnification varies widely from plate to plate. And no attempt has been made to achieve uniformity of positioning of the grains in the SEM, photographs essential if they are to be used diagnostically. We are told that interference

photomicroscopy was employed because of its great use in such groups as *Urtica*. Possibly, but it is far from convincing that its use in most of the other groups illustrated adds anything to the book.

Part 2 deals with fungus spores, but it differs markedly from Part 1 in having no keys, in offering only a selection of representative types and illustrations, and in providing nothing more than a glossary to initiate the novice into the distinctive descriptive

terminology of mycology. It creates the impression of being an afterthought.

This book will find its way into most North American pollen-spore labs, but whether it becomes dirty and dog-eared with use is another question.

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ENVIRONMENT

A Vanished World: the dinosaurs of western Canada

By Dale A. Russell. 1977. Natural History Series Number 4. National Museum of Natural Sciences, National Museums of Canada, Ottawa. 142 pp. \$12.95.

In his introduction to *A Vanished World*, Dale Russell states that "The purpose of this volume is to visualize, so far as possible, the vanished world of Canadian dinosaurs . . . it is hoped that this work will help others to understand what western Canada may have been like during a very interesting and relatively well documented period of its physical history." Upon reading the book, one cannot help but conclude that in the short space of 142 pages, the author has managed to manifest successfully a most original approach to the study of the dinosaur era.

The book is filled with superb photographs (by Susanne M. Swibold) of the Canadian badlands, and of modern vegetation and habitats that compare closely with the projected environments of the Late Cretaceous in Canada. The photographs are complemented by equally striking artistic reconstructions (by Eleanor M. Kish) of many of the Canadian dinosaurs described in the text. All photographs and illustrations are in color.

The first chapter deals with the history of dinosaur collecting in western Canada, and as most published histories of palaeontology are concerned mainly or only with American localities and collectors, much of the material will be new to the general reader.

The second chapter provides a general survey of the geology of the Canadian badlands, with a brief insight into the methods of interpreting the prehistoric geography of an area from its sediments.

The third chapter describes Dinosaur Provincial Park in Alberta, an area of about 15000 acres of badlands containing exposed sediments that are from 76 to 73 million years old. At that time, Dinosaur Provincial Park was part of an ancient alluvial plain situated between the Rocky Mountains and the great inland sea which then covered much of the interior of

the North American continent. Considering in turn the sediments themselves, then their plant, invertebrate, and vertebrate remains, the author logically and precisely reconstructs the environment of that period. A short section at the end of the chapter invites the reader to imagine himself back in those times and then to consider the possibility of his own survival under such conditions.

The fourth chapter treats the badlands around Drumheller, Alberta in a similar manner. The sediments of the Drumheller region contain fossil remains ranging from 72 to 70 million years in age. At that time, Drumheller was located on the southern edge of a large delta that extended more than 200 miles from the Rocky Mountains to the inland sea. The delta was "an enormous low-lying wetland of shallow lakes, swamps and marshes, traversed by streams that fanned out from the major river courses to the edges." Various aspects of the ecology of the delta are discussed, from the patterns of deposition of sediments to the vegetation and the dinosaurs that inhabited the area. Over a period of a few hundred thousand years, the ecosystem changed and the delta developed the characteristics of a coastal plain, as stream beds shifted and the swamps drained. The vegetation became markedly different from that of the wetland period, with forests of broad-leaved trees, many of which are familiar to us today. The kinds of dinosaurs inhabiting this drier, hardwood-forested area were somewhat different from those that lived in the swamps.

The fifth chapter takes us through the sediments of 70 to 65 million years ago into the geological period that signalled the end of the dinosaurs. The vegetation and the dinosaurs that lived on the large subtropical floodplain of this period are discussed. Because the floodplain extended into the United States, contemporary dinosaurs from Montana, Wyoming, and the Dakotas are also reviewed.



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