



SEX change — the tiny threadlike plant *Lacandonia schismatica* is unique in that the orientation of its sex organs is reversed: its stamens arise within several rings of pistils. Awarded a family to itself, it was discovered by researchers cataloguing all the vascular plants (some 18,000 species) of Mesoamerica — the southern states of Mexico and the republics of Central America. Two new genera and 104 new species were also found. The project was organized by the Natural History Museum in London, the Universidad Nacional Autónoma de México and the Missouri Botanical Garden. The first volume of *Flora Mesoamericana* (in Spanish) is now published in Mexico.

Steps up the botanical spiral

Martin Ingrouille

Flora Europaea, Volume 1: Psilotaceae to Platanaceae. Second Edition. Edited by T. G. Tutin *et al.* Cambridge University Press: 1993. Pp. 581. £100, \$200.

The Families of Flowering Plants: Interactive Identification and Information Retrieval. By L. Watson and M. J. Dallwitz. CSIRO: 1994. \$180 (CD-ROM and manual).

Phyllotaxis. By Roger V. Jean. Cambridge University Press: 1994. Pp. 386. £45, \$74.95.

Life Processes of Plants. By Arthur W. Galston. Scientific American Library/W. H. Freeman. Pp. 246. £19.95, \$32.95.

THE production of the second edition of the first volume of *Flora Europaea* is a landmark. The book was first published 29 years ago, and proved a valuable spur to further research. Inevitably the quality of the individual systematic accounts were variable, but the new edition is a great step forward. Many of the accounts have been revised to a high standard by one author, John Akeroyd, and 350 new taxa have been included, hundreds new to science (20 taxa have been deleted).

This might give the impression that everything is cut and dried — and why not, especially for a region with the longest and most extensive history of taxonomy? But consider the last family record in the first volume, the Platanaceae. Not a complicated taxonomic situation. It has a single ancient genus dating back at least to the middle Cretaceous with only two European species: *Platanus orientalis*, the oriental plane, which grows in woodlands

hidden in the steep rocky gorges of the Balkans; and the London plane, *Platanus acerifolia*. *Flora Europaea* still records that the "origin and taxonomic status of this plant have been much discussed but are still uncertain. Some authors consider it to be a hybrid. Others regard it as a cultivar of *P. orientalis*." It used to add in the first edition: "As its origin is unknown there seems at present to be no means of deciding between these possibilities". Well now there is. The whole field of molecular systematics has burgeoned since the first edition and yet this information has scarcely touched the delimitation of taxa recorded in the second edition of the *Flora*. There is work to be done for the European plant taxonomist yet, even in Europe.

The publication of *The Families of Flowering Plants* indicates a new way forward: descriptions, keys and pictures for 563 families on a CD-ROM, which can be accessed 'interactively'. The package requires an MS-DOS-based computer with 640 kilobytes of RAM and 1.5 megabytes of hard-disk space. Installation is easy and the interactive key, which is at the heart of the package, is simple to master with the use of on-screen menus. Subsets of characters, taxa or geographical regions can be chosen. The reader or operator can choose to present the characters in any order. In identifying a specimen, the command 'BEST' gives a list of characters ordered by greatest predictivity. In scoring characters in turn, the number of possible taxa declines, until only a few taxa remain to be compared, or only the correct one. A full description or illustration can then be called up to check

the identification.

The descriptions are recorded in the DELTA format, which maximizes accessibility and the potential for modification. This is the package's greatest strength. It will grow in resolution and sophistication, so its potential for information retrieval and teaching is great. The only danger is that the package is so easy to use that it may lull the unwary into incorrect identifications; in practice, many characters are not readily resolvable, and the primary data have been culled from several sources that no doubt include many incorrect interpretations.

But it is not too grandiose to think that *The Families of Flowering Plants* represents a stage in plant taxonomy as important as the publication of Linnaeus's *Genera Plantarum* in 1737. Like that work, this CD-ROM should provide a stairway for the aspiring botanist, even though it too is imperfect and incomplete; but it is the big first step to a global flora available on disk. Even though the interface is a little awkward, the work is already great fun. A Windows version with greater graphical possibilities is promised.

Phyllotaxis is a step up the botanical spiral staircase. The author presents a united interpretation of the most fundamental patterns of plant morphology, the genetic spiral arrangement of leaves, buds or flowers. This is a marvellous little book. Much of the mathematics is related to Fibonacci numbers and especially the golden ratio, tau $((\sqrt{5}+1)/2)$. "Not only does tau symbolise ratio and proportion, but it also represents one of the oldest symbols of life, τ , the symbol known to ancient Egyptians (the ankh) and ancient Hindus. This book is about one of the most fascinating expressions of life, harmony, and fivefold symmetry." It provides a framework for understanding patterns: what are permitted or more likely, and what are the constraints on developmental or evolutionary change. There are many fascinating examples, side-alleys and speculations. Did you know, for example, that there is a tendency for the genetically determined spiral in palm trees to wind left-handed in the Northern Hemisphere and right-handed in the Southern Hemisphere?

For those wanting more basic facts, *Life Processes in Plants* provides a clear summary of plant physiology, presented with many colour diagrams and the minimum of obscure terminology. One of the latest in the Scientific American Library series, the book is designed for the general reader, although it is by no means superficial. □

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