Flora of Australia

The introductory volume of a new 'Flora of Australia' has been published. The book, planned to be the forerunner of some 50 volumes describing all plant groups more complex than bacteria, was launched at the XIIIth International Botanical Congress in Sydney last August.

The only previous publication attempting to cover the flora of the whole continent appeared more than 100 years ago. Remarkably, George Bentham, whose seven-volume 'Flora Australiensis' came out over the period 1863–78, never came to Australia.

By consulting plant collections in England and France, as well as specimens lent from Melbourne, he surveyed 8125 species from 'down under' — and did so to such good effect that a facsimile edition of his work was published as recently as 1967.

Since Bentham's time, botanists have compiled floras for every State and Territory except Western Australia, usually basing them on the 'Flora Australiensis'.

The idea of a new national 'Flora' has been aired for more than 70 years, but took material form only in 1973, when the Federal government set up a council that spawned, 5 years later, the Australian Biological Resources Study, which initiated work on the new 'Flora' in 1979.

No modern author could emulate Bentham's single-handed feat. Some 18 000 species of vascular plants — that is, ferns and their allies, together with flowering plants, conifers, and other seed plants — are already known; new research, and the addition of simpler plants such as mosses and fungi, could push the total to 25 000.

This figure includes, as does the new 'Flora', both native plants and those from overseas that have established themselves in our landscapes.

Chromosome numbers

Botanists today have much more to say about each plant, too, than in Bentham's time. Although the 'Flora's' descriptions are to be, in scientific terms, concise rather than monographic, they will incorporate up-to-date information on distribution (in words and maps) and, where possible, ecology and chromosome numbers, in addition to the size and shape of the plant and its parts.

All these accounts will be based on Australian specimens except where the authors have to look farther afield to obtain a satisfactory taxonomic view, as when describing the characteristics of groups the size of genera and families.

Botanists throughout Australia, and some in other countries, have helped the new 'Flora' to germinate, and its growth will depend on the further efforts of many — probably several hundred — contributors, particularly in State herbaria, in the national Herbarium Australiense (which is administered by the CSIRO Divisions of Plant Industry and Forest Research), and in universities.

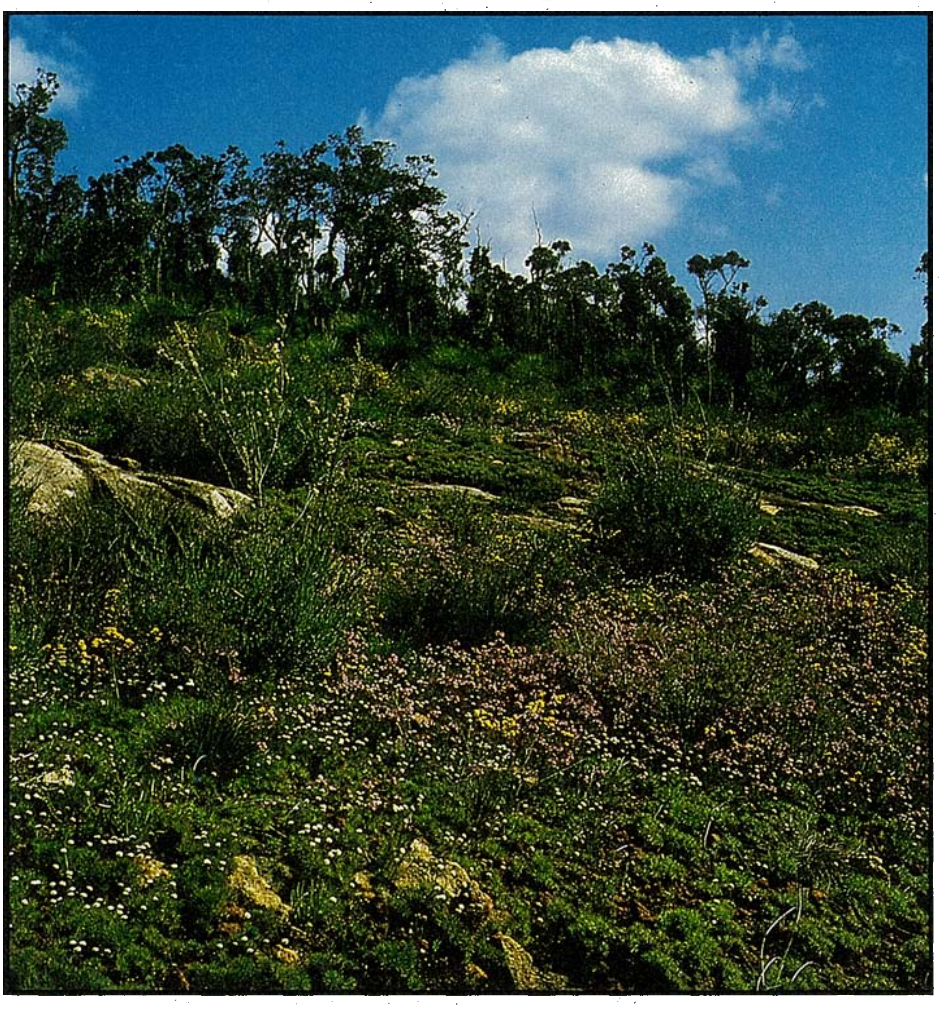
Choosing a zoological metaphor, the executive editor of the 'Flora', Mr Alexander George, remarks that the work 'has had a long gestation and a difficult birth', but that it constitutes 'the most exciting botanical project undertaken in Australia', whose completion will amount to 'a major achievement of national and international co-operation'. That completion, the editors predict, is 20 years off.

At the outset, the 'Flora's' Editorial Committee, chaired by Sir Rutherford Robertson, had to choose one from the various arrangements of flowering plant families proposed by plant taxonomists. The Committee selected the system of Dr Arthur Cronquist of the New York Botanical Garden, and soon allocated the Australian families to 46 volumes.

Immediately inside its front cover, Volume 1 of the 'Flora' lists the contents of all the volumes planned so far. The first forms the introduction to the work; numbers 2–47 will cover the flowering plants; Volume 48 will describe the gymnosperms (conifers and other non-flowering seed plants) and pteridophytes (ferns and their relatives); and the simpler, non-vascular, plants will feature in subsequent issues.

Conversely and conveniently, an index inside the back cover of Volume 1 enables you to look up a flowering plant family and see which volume it will appear in.

Spring flowers on a granitic slope in Western Australia.



The volumes will be published not in numerical order, but as they are finished. The earliest will be those that treat well-known families or whose authors are immediately available for the necessary research.

The Australian Government Publishing Service has produced a leaflet listing 14 volumes expected relatively soon: these will describe 88 of Australia's 237 families of flowering plants in full and two others in part (including the eucalypts, figs, pinks, mistletoes, and grass-trees), as well as the gymnosperms and pteridophytes.

Region covered

The 'Flora' will encompass the entire vegetation of all the Australian States and Territories, nearby offshore islands, and Macquarie Island. Other territories administered by Australia, such as Lord Howe Island and Christmas Island, will be mentioned where they come within the range of species included in the work, but will otherwise be excluded. The editors hope eventually to publish a flora of these territories as a separate volume.

When the 'Flora' is complete, its keys should enable you to identify any species, although some familiarity with plants will inevitably increase your chance of success. The work claims to be 'designed for use by persons with some botanical knowledge'; just how much will be required for identification may be gauged from existing floras and from the introductory key (to flowering plant families) included in Volume 1.

This key was developed by Dr Trevor Clifford of the University of Queensland from one that he and Mrs Gwen Ludlow produced in 1978 for the families and genera of Queensland's flowering plants. It has the modern, clear format of short, numbered questions — in contrast to, say, the loquacious keys of Black's 'Flora of South Australia', compiled more than half a century ago.

Unlike the keys in old floras, Dr Clifford's makes great use of relatively conspicuous characters that the field naturalist can readily examine.

Volume 1 sets the scene for the rest of the work. After a short introduction come three chapters on the history of the project, the evolution of Australia's plants, and the classification system used in the 'Flora'. Then follow Dr Clifford's key to flowering plant families, an illustrated glossary, and a brief index.

The volume is illustrated by a handful of photographs; the coloured ones depict the floral emblems of all the States and Territories and *Acacia pycnantha* or golden wattle, the unofficial emblem of the nation, and three contrasting habitats. The CSIRO Division of Computing Research had a hand in the book's production, contributing typesetting facilities.

Theories of evolution

Dr Bryan Barlow, head of the major unit of Herbarium Australiense, located in the CSIRO Division of Plant Industry in Canberra, wrote the chapter on the origins and evolution of Australia's flowering plants.

He describes the 19th-Century 'invasion theory' (that the Australian region was colonized by plants that travelled considerable distances over seas or 'land bridges' to become established in an isolated continent) and the enormous impact subsequently made by geology's theory of plate tectonics.

Botanists now believe that flowering plants originated long before the supercontinents split and drifted apart. Our earliest flora probably spread across Australia along several routes, including a subtropical path from Africa via India, and a temperate path from South America via Antarctica, at a time when all these land masses were one. (*Ecos* 24 discussed the origins of Australian rainforest in some detail.)

This flora then diversified as the climate became cooler, locally drier, and more seasonal. After splitting from Antarctica, our continent was isolated for perhaps 30 million years while it slid slowly northwards, until it collided with the Sundaland plate, bringing two rich floras, the Australian and Indo–Malayan, into contact. With the fence down, plants spread both ways, Australia gaining the larger number of immigrant species.

Dr Barlow includes sections on the history and ecological significance of Torres and Bass Straits, on those spectacular genera *Eucalyptus* (more than 500 species, all but about 10 endemic to Australia) and *Acacia* (about 835 species), on the arid zone, and on the need for conservation.

Another member of the Herbarium Australiense staff, Dr Andrew Kanis, contributes a chapter on taxonomy, paying particular attention to the Cronquist system, and Mr George tells the history of the 'Flora of Australia', from a proposal in 1907 to the Federal government's formal announcement in 1979 that the project was under way.

Dr Alison McCusker, acting director of the Bureau of Flora and Fauna, which coordinates the project, compiled the glossary, incorporating 25 pages of explanations of botanical terms. A further 4 pages of clear line diagrams, by Dr Helen Hewson of the Bureau, illustrate the main terms used to describe, for example, leaf shape and the placentation of ovules. Future volumes will include explanations of further technical terms that crop up.

John Seymour

'Flora of Australia: Volume 1, Introduction' may be obtained from Australian Government Publishing Service bookshops or from AGPS Mail Order Sales, Box 84, P.O., Canberra, A.C.T., 2600, for $12.50 (hard cover) or $9.50 (soft). For postage and packing add $3 (hard) or $1 (soft).

1. Anthocercis viscosa R. Br., *Prodr.* 448 (1810)

T: King George Sound, W.A., *R. Brown s.n.*; syn: BM.

Erect, sometimes spreading or straggling shrub to 3 m, pubescent with glandular hairs; branches viscid. Leaves obovate to ovate, almost sessile, 20–60 mm long, usually 10–30 mm wide, minutely serrulate-crenulate, viscid. Inflorescence cyme-like, 1–3-flowered, pedunculate; pedicels 5–15 mm long. Calyx 3–15 mm long. Corolla 20–48 mm long, white to creamy-white, the striations green or purplish; lobes ovate-triangular to linear, 12–25 mm long, sometimes with pale purple streaks. Stamens 4.5–12.5 mm long. Capsule ovoid to ellipsoid, acute or apiculate, 8–19 mm long. Seeds 1.8–3 mm long. *Sticky Tailflower.*

Endemic in W.A. along the southern coastline westwards from Cape Arid. Always associated with granite outcrops. Suspected of poisoning stock. There are two subspecies.

Corolla-lobes 1.5–2.5 times longer than wide and less than 1.5 times as long as corolla-tube — **1a.** subsp. viscosa

Corolla-lobes 3–5 times longer than wide and usually twice as long as corolla-tube — **1b.** subsp. caudata

Part of a page from Volume 29, which is devoted to Solanaceae, the family to which potatoes and tomatoes belong.