Surveying Australia's plants and animals

Australia's plants and animals have always excited naturalists ever since Sir Joseph Banks landed with Captain Cook at Botany Bay. Sir Joseph, indeed, was so impressed by what he collected that he used his influence as President of the prestigious Royal Society of London as well as his personal fortune to promote biological exploration on the continent.

The Cape York lily can be seen only during the wet season.

One only has to look at John Gould's *Birds of Australia*, or his *Mammals of Australia*, or Bentham's *Flora Australiensis* to see the fascination that our plants and animals have held. Yet today our detailed knowledge of our flora and fauna remains remarkably patchy — a legacy of haphazard study for nearly two centuries.

For example, our mammals, our birds, and some of our higher plants are generally well represented in collections, and most species have been described and named. The same applies for spectacular insect and mollusc orders (such as butterflies and cowries), but these conspicuous groups comprise only a small portion of our flora and fauna. The rediscovery in 1977 by Dr Bob Taylor of the CSIRO Division of Entomology of *Nothomyrmecia macrops*, the most primitive living ant known, and last year's discovery of a new family of crickets by Mr Ted Dahms of the Queensland Museum underline how much we still have to learn. To discover a new family of insects in Europe or North America would cause a considerable stir.

These are *Nothomyrmecia macrops*, the most primitive living ant known, first discovered in 1931 near Esperance, W.A. Rediscovery of this species in 1977 near Ceduna, S.A., caused considerable international interest.

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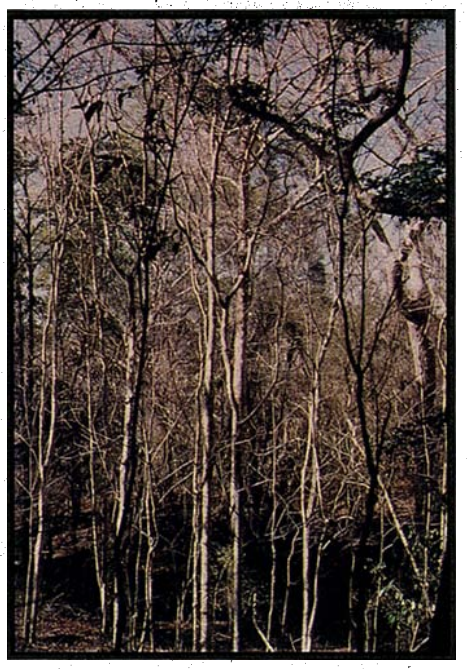
Although some Australian colonies established museums and herbaria early on, these institutions contributed little to knowledge about our plants and animals until the latter part of the 19th Century. Instead, early colonial naturalists relied on the European repositories of knowledge, such as the British Museum and the Royal Botanic Gardens at Kew.

So it's not surprising that the comprehensive works of the 19th Century on Australian plants and animals came from Europe, not from our local institutions. Some of these still remain the only comprehensive works. No replacement, for example, has appeared for Bentham's already-mentioned *Flora Australiensis*, which was published between 1863 and 1878. This century-old work deals with some 7800 of the higher plants, but today the number of species of such plants is thought to total about 25 000.

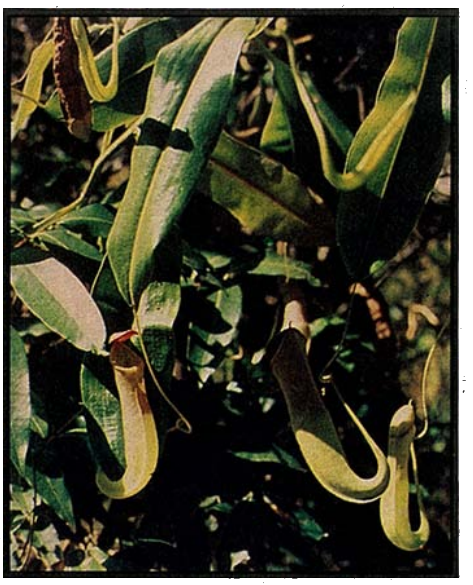
Coordinator lacking

Perhaps the major reason for the haphazardness of Australian studies of the local plants and animals has been that there has been no effective national institution that can coordinate and encourage development of a national picture. All States, of course, have carried out taxonomic studies in their own museums and herbaria for many years. Various CSIRO Divisions and other Commonwealth agencies have done so as well.

But the priorities of the State agencies have been tailored mainly to meet 'customer demand' within those States. In other words, most taxonomists in our museums and herbaria are employed to study those groups of plants and animals that arouse the greatest local public interest — conditions not conducive to studying the nation's flora and fauna as a whole.



A tall deciduous forest located on the McIlwraith Range, Cape York. The Australian Biological Resources Study supported studies of the ecological biogeography of Cape York by Dr Jiro Kikkawa of the University of Queensland.



The pitcher plant, *Nepenthes mirabilis*, which traps insects on Cape York.

Two years ago, the Australian Biological Resources Study was set up as a permanent body within the Commonwealth Department of Science to perform the much-needed coordinating role. It is led by its Director, Dr David Ride.

The main functions of this Study are twofold:

- to coordinate taxonomic work at a national level
- to provide funds for studies of important parts of our flora and fauna that are currently receiving little attention

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Public pressure for a biological survey of Australia first arose in 1909 through the Australasian Association for the Advancement of Science (the fore-runner of ANZAAS — the Australian and New Zealand Association for the Advancement of Science).

A Commonwealth government first made a commitment to the idea 15 years later when it made an agreement with Sir Colin MacKenzie that his extensive zoological collection should be acquired to form the nucleus of a national museum of Australian zoology. (This later became the Australian Institute of Anatomy in Canberra.) More national scientific resources were also committed to taxonomy and ecology during the 1930s and 1940s through a number of Divisions of what is now CSIRO.

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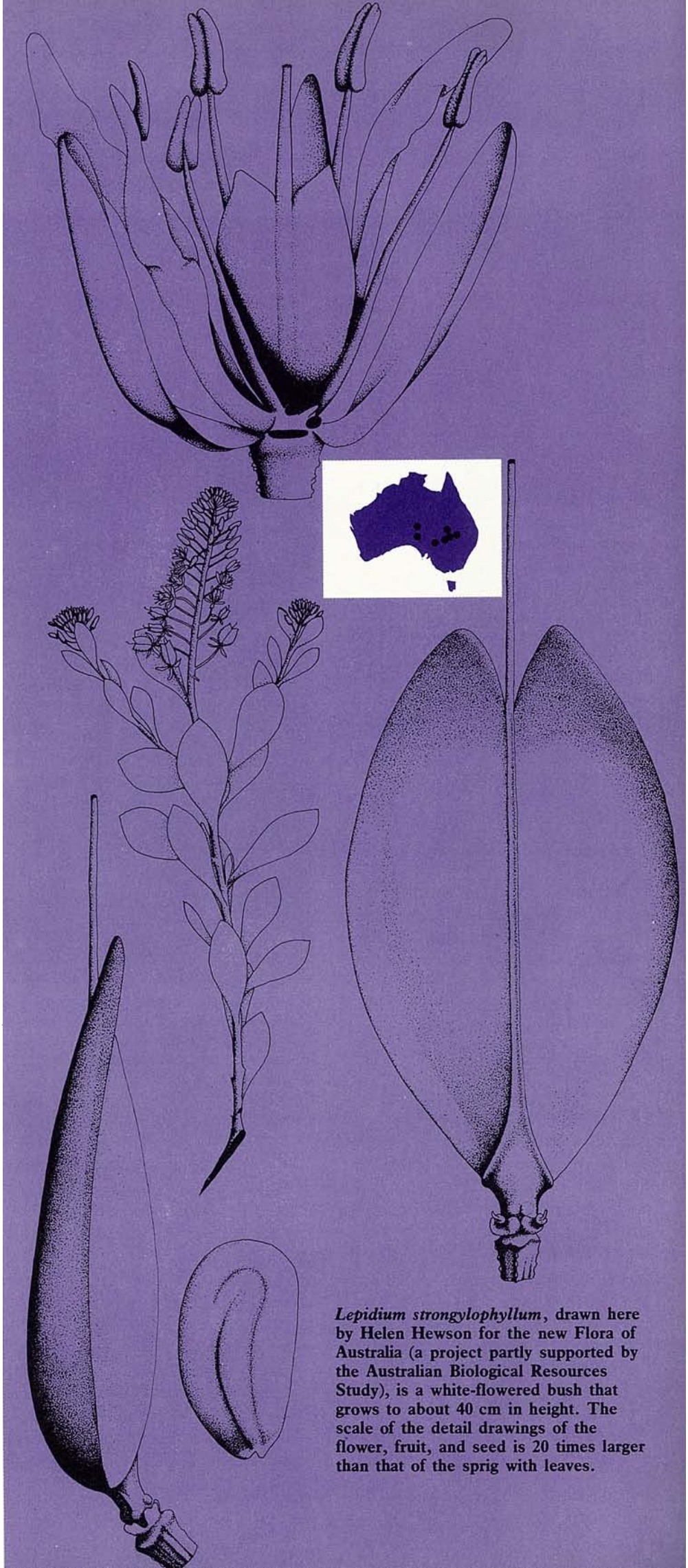
During the years that followed World War II, ANZAAS renewed its agitation for a biological resources study of Australia, and in 1962 the Academy of Science recommended to the Prime Minister of the day that a museum of Australian biology should be set up in Canberra. This would have the functions of conducting a biological survey and publishing a Flora of Australia.

Pressure pays off

No action followed. However, by 1972 political interest in the idea of a national biological survey had reached a level such that both the major political parties incorporated proposals for a survey in their election platforms. The Australian Biological Resources Study began as a stop-gap operation under the guidance of the Interim Council in 1973. (From 1976 onwards it was housed at the CSIRO Divisions of Land Use Research and Plant Industry in Canberra, and staffed partly by CSIRO and partly by the then Department of Science.)

During its 3-year lifetime this Council received $750 000 to support taxonomic and ecological studies. It put forward its recommendations as to what functions a



Lepidium strongylophyllum, drawn here by Helen Hewson for the new Flora of Australia (a project partly supported by the Australian Biological Resources Study), is a white-flowered bush that grows to about 40 cm in height. The scale of the detail drawings of the flower, fruit, and seed is 20 times larger than that of the sprig with leaves.

permanent Biological Resources Study should serve in 1975.

The Interim Council recommended four projects, which it considered that a permanent governing body of the Study should carry out to encourage taxonomic and ecological research. These were: compiling a flora of Australia, supporting and coordinating an Australian biological resources data service, mapping the continent's vegetation at various scales, and publishing catalogues of Australian fauna. These and other studies considered appropriate by the governing body would be carried out in collaboration with existing State and Commonwealth government institutions.

To carry out these projects, the Interim Council recommended that the permanent body would operate in two ways:

- by using a proposed Australian biological resources fund to finance institutions and individuals to carry out work it required on contract
- through an institution to be known as the institute of the Australian flora and fauna, which the government would finance independently of the resources fund.

The Interim Council recommended that both the institute and the fund should operate under a new Act of Parliament.

After being considered by a number of government committees, the Interim Council's recommendations were finally referred to the Interim Australian Science and Technology Council (ASTEC), which put forward its own somewhat similar recommendations for biological surveys in Australia early in 1977. It too recommended establishment of the institute of Australian flora and fauna, and what it suggested be called the Australian floral and faunal fund, but with the difference that the fund should be administered by the institute. ASTEC did not recommend that a new Act would be needed.

Details

For the time being, at least, the institute and fund have not eventuated. Instead, it was announced in the 1978–79 Federal Budget that the permanent Australian Biological Resources Study would be established as a unit within what was then the Commonwealth Department of Science. Senator Webster, the Minister for Science and Environment, announced the composition of the permanent Advisory Committee for the Study during December last year. Its chairman is Sir Rutherford Robertson, one of Australia's most distinguished biologists.

No replacement, for example, has appeared for Bentham's Flora Australiensis, *which was published between 1863 and 1878.*

All the CSIRO staff have now been transferred to the Department's payroll. However, the scientists of the Biological Resources Study will probably continue to be located within CSIRO Divisions. The Organization retains some voice in the operations of the Resources Study through its representation of the new permanent Advisory Committee.

During its 3-year lifetime, the interim Resources Study was able to use the total of $750 000 that it received to make some progress with the Study's two aims — of supporting taxonomic work nationally and providing funds for studies of important parts of our flora and fauna that currently receive little attention. It also looked into how information about our animals and plants could be stored in a national computer network.

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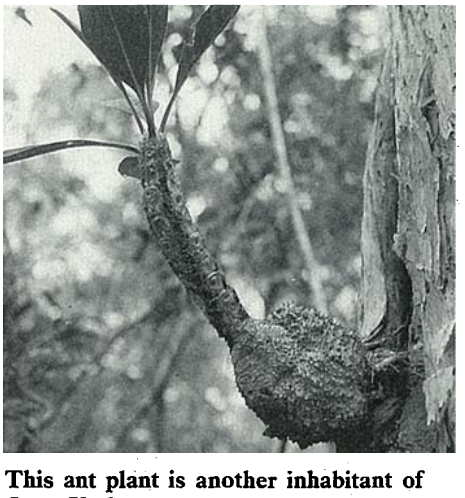

This ant plant is another inhabitant of Cape York.

However, because of its interim nature, the Study's Council had to give funds for short-term studies. But, as Dr Ride has commented, 'taxonomic advance depends upon the steady growth of collections and their proper maintenance; support for these aspects requires steady and long-term funding'. Giving short-term grants merely encouraged taxonomists to study familiar areas that would probably yield results quickly.

Now that the Australian Biological Resources Study is permanently established it is able to commission long-term studies. However, with a first year's budget of $250 000 — less than one-third of that recommended by the interim ASTEC — what the Study can achieve has remained severely limited.

It's interesting that when the Interim Council advertised in the national press for applications from institutions and individuals for research grants, it received a total of 339 applications. These requests for funds, which came from all States and mainland territories, totalled $5·76 million during the 3-year period that the Interim Council was in existence. Obviously, only a fraction of these applications could be financed.

But this doesn't mean that the Australian Biological Resources Study has been completely ineffectual to date. Indeed the list of projects in which the Study has been involved since 1973 stands at 89. It includes the re-establishment of the Tasmanian Herbarium, a study of the preservation of biological material in Australian museums, completion of mapping of Western Australia's vegetation, and surveys of the following: fauna of the rainforest of north-eastern Queensland, the inland fish fauna of inland New South Wales and Central Australia, and the plants and animals of Cape York Peninsula as well as those of the Prince Regent and Drysdale River areas of Western Australia.

More about the topic

Australian Biological Resources Study 1973–78. (Australian Government Publishing Service: Canberra 1978.)

Towards a national biological survey. W. D. L. Ride. *Search*, 1978, **9**, 73–81.

Report of the Interim Australian Science and Technology Council for the period 29 April 1976 to 29 March 1977. (Australian Government Publishing Service: Canberra 1977.)