

ENCEPHALARTOS

JOURNAL OF THE
CYCAD SOCIETY OF
SOUTH AFRICA

TYDSKRIF VAN DIE
BROODBOOMVERENIGING
VAN SUID-AFRIKA

NO. 31

SEPTEMBER 1992



ENCEPHALARTOS

JOURNAL OF THE
CYCAD SOCIETY OF
SOUTH AFRICA

TYDSKRIF VAN DIE
BROODBOOMVERENIGING
VAN SUID-AFRIKA

NO. 31

SEPTEMBER 1992

EDITOR/REDAKTEUR

NEIL MUNRO
P.O. BOX 2373
EDENVALE
1610

VOORBLAD/COVER

*Female Cone of Encephalartos inopinus
in a Durban garden.*

Photo: Roy Osborne

CONTENTS-INHOUD

<i>FROM THE PRESIDENT / VAN DIE PRESIDENT</i>	2
<i>EDITORS FAREWELL</i>	3
<i>FOCUS ON / FOKUS OP</i>	4
<i>RESCUE OF E. NATALENSIS TRUNK</i>	9
<i>NATAL PARKS BOARD AWARD</i>	10
<i>AUSTRALIAN CYCADS</i>	12
<i>NAPLES BOTANICAL GARDEN</i>	18
<i>CYCAS POLLINATION</i>	22
<i>THE CYCAD CONUNDRUM</i>	26
<i>LETTERS</i>	30
<i>EXPRESS</i>	34
<i>INDEX TO "FOCUS ON SERIES"</i>	38

FROM THE PRESIDENT

VAN DIE PRESIDENT

As you will see in the Membership Application form in the back of this issue of the magazine, Council was forced to increase the fees for 1993 by approximately 10% and to reduce the rebate for local pensioners from 50% to 25%. With the 50% rebate that was granted thus far, the fees paid by local pensioners did not even cover the printing costs of the magazines that they received.

Council recently also decided to furnish members biannually with a complete list of members and their **addresses**. The lists will be mailed together with the June issue of *Encephalartos* starting 1993. We trust that this will enhance communication between members and that members will consequently welcome the decision.

One of our members informed me about recent court cases relating to the unlawful possession of cycads. In one case Leon Gerhardus Botha of Rosslyn, Pretoria was fined R1500 (of which R750 was suspended for 5 years) for the illegal possession of 20 cycads which are valued at R20 000.

In another case Harry Patrick Dowling and Stephanus Schnetler were each fined R1000 (suspended for 5 years) for the unlawful removal of 27 *E. horridus* plants from a farm in the Uitenhage district.

In the third case Daniel Johannes Kluyts of 21 Wisteria Street, Despatch, was found guilty in the Uitenhage magistrate court of the unlawful removal of 30 *E. longifolius* plants from the Groendal Nature Reserve. He was fined R1500 of which R1000 was suspended.

In all three the above cases, the fines that were imposed would appear to be hopelessly inadequate. Has it not become time for our magistrates to effectively support the law enforcement officers in their very difficult task by passing much heavier sentences in cases such as those reported on above to act as effective deterrents?

Nat. Grobbelaar

Soos u in die Lidmaatskap-aansoekvorm agter in hierdie uitgawe van die tydskrif kan sien, was die Raad verplig om die ledegelde vir 1993 met sowat 10% te verhoog en om pensioenarisse in die vervolg slegs 'n 25% in plaas van 'n 50% afslag te gee. Met die 50% afslag wat ons dusver aan pensioenarisse toegestaan het, het die ledegeld wat hulle betaal het nie eens die drukkoste van die tydskrif wat hulle ontvang het gedek nie.

Die Raad het onlangs besluit om vanaf Junie 1993 al om die ander jaar 'n volledige lys van die name en adresse van ons lede saam met die Junie-uitgawe van *Encephalartos* aan lede te voorsien. Ons hoop dit sal baie help om kommunikasie tussen lede te vergemaklik en dat hierdie diens gevolglik deur lede verwelkom sal word.

Een van ons lede het my aandag gevestig op onlangse hofsake aangaande die onwettige besit van broodbome. In die een geval is Leon Gerhardus Botha van Rosslyn, Pretoria, op Uitenhage R1500 beboet (waarvan R750 vir 5 jaar opgeskort is) vir die onwettige besit van 20 broodbome waarvan die waarde op meer as R20 000 geskat word.

In 'n ander geval is Harry Patrick Dowling en Stephanus Schnetler elk slegs R1000 beboet (opgeskort vir 5 jaar) vir die onwettige verwydering van 27 *E. horridus* plante van 'n plaas in die Uitenhage distrik.

In die derde geval is Daniel Johannes Kluyts van Wisteriastraat 21, Despatch in die Uitenhage landdroshof skuldig bevind aan die onwettige verwydering van 30 *E. longifolius* plante uit die Groendal Natuurreservaat. Hy is R1500 beboet waarvan R1000 opgeskort is.

In al drie bogenoemde gevalle lyk dit of die boetes wat opgelê is heeltemal te klein was om doeltreffend te wees. Het dit nie tyd geword dat ons landdroste die wetstoepassers op 'n meer daadwerklike wyse in hul moeilike taak help deur baie swaarder strawwe op te lê as wat hier gerapporteer word nie?

Nat. Grobbelaar

FAREWELL TO NEIL MUNRO

In the beginning of 1989 Neil Munro and Bunny Wentzel jointly took over the editorship of *Encephalartos* from Maans Kemp. Neither of them had any previous experience of such work but they tackled the job with such dedication and confidence that the challenge was mastered with great success. Bunny Wentzel resigned as one of the editors in the second quarter of 1990 and from the middle of 1990 Neil managed the editorial duties of *Encephalartos* on his own. Thus Neil has been editor of *Encephalartos* for almost half the issues that have appeared to date (numbers 17 to 31 inclusive).

To our Overseas members especially, *Encephalartos* and the Society are virtually synonymous and Neil has been complimented on many occasions by members for the valuable work he is doing for the Society. On behalf of Council I would hereby publicly like to add our appreciation for Neil's good work which obviously must have made many inroads into his private and family life. We do, however, trust that the endearment that Neil has secured with our members will convince him that the many hours of toiling with the magazine was worth the while. We wish him a most pleasant and peaceful future.

Dr Isabella Claassen of P.O.Box 11322, Brooklyn 0011, South Africa is taking over the editorship of *Encephalartos* from Neil and any contributions to the magazine should therefore be sent to her address in future.

Nat. Grobbelaar
President of the Cycad Society of S.A.

Thank you Mr. President for your kind words. As I am only a weekend gardener and hardware salesman doing something completely out of my arena was quiet an experience.

I must thank all the contributors to the journal and in particular all the authors of the "Focus On" series which to me is the backbone of the journal.

Maans Kemp did a fine job in layout and design of the first journal and I simply followed the format. However, with a new Editor - possibly a new design and format will emerge.

CYCAD COLOUR PHOTO COMPETITION

In view of the Third International Conference on Cycad Biology (CYCAD 93) which will be held in Pretoria in July 1993, Council resolved that the front cover of the June 1993 issue of *Encephalartos* should carry a full colour photograph of some aspect of a cycad to commemorate this momentous event.

In order to obtain a good photograph for this purpose, it has been decided to hold a colour photo competition and to present the winner with a copy of *Cycads of the World* by D.L.Jones which should appear shortly and promises to be much in demand by cycad enthusiasts.

Material must be presented either as 35 mm or larger mounted transparencies or as unmounted colour prints 150 mm x 200mm in size. There is no restriction on the number of photographs that a participant may enter.

Although the material presented will remain the property of the participant, it will be returned to him/her only if a suitably stamped return envelope accompanies the photo(s). The Cycad Society of South Africa will, however, have the right to publish any of the material in *Encephalartos* and/or exhibit it at CYCAD 93 with the usual acknowledgements.

No reasons for the choice of the winner needs to be given and the verdict of the panel of judges will be final.

Entries should be mailed to the:
93 Competition, P O Box 15357, Lynn East, 0039, South Africa, to reach it before the end of February 1993. All entries will be acknowledged by return mail.

Several of our members have suggested that we should regularly adorn the front cover of *Encephalartos* with a colour photo of a cycad. Council has gone into the matter and concluded that this will result in an increase of approximately R10 in the the annual dues of members. Council has therefore provisionally decided against the idea but would appreciate it to get the feeling of our members on the issue. Opinions can be sent to The President, at the address provided above.

My best wishes to Dr. Claasen whom I believe is a botanist. I am sure we can look forward to a technically correct journal.

Farewell readers I look forward to my retirement, the forthcoming summer, and hopefully I can concentrate on my new hobby and do some serious twitching.

Neil Munro



FOCUS ON ...

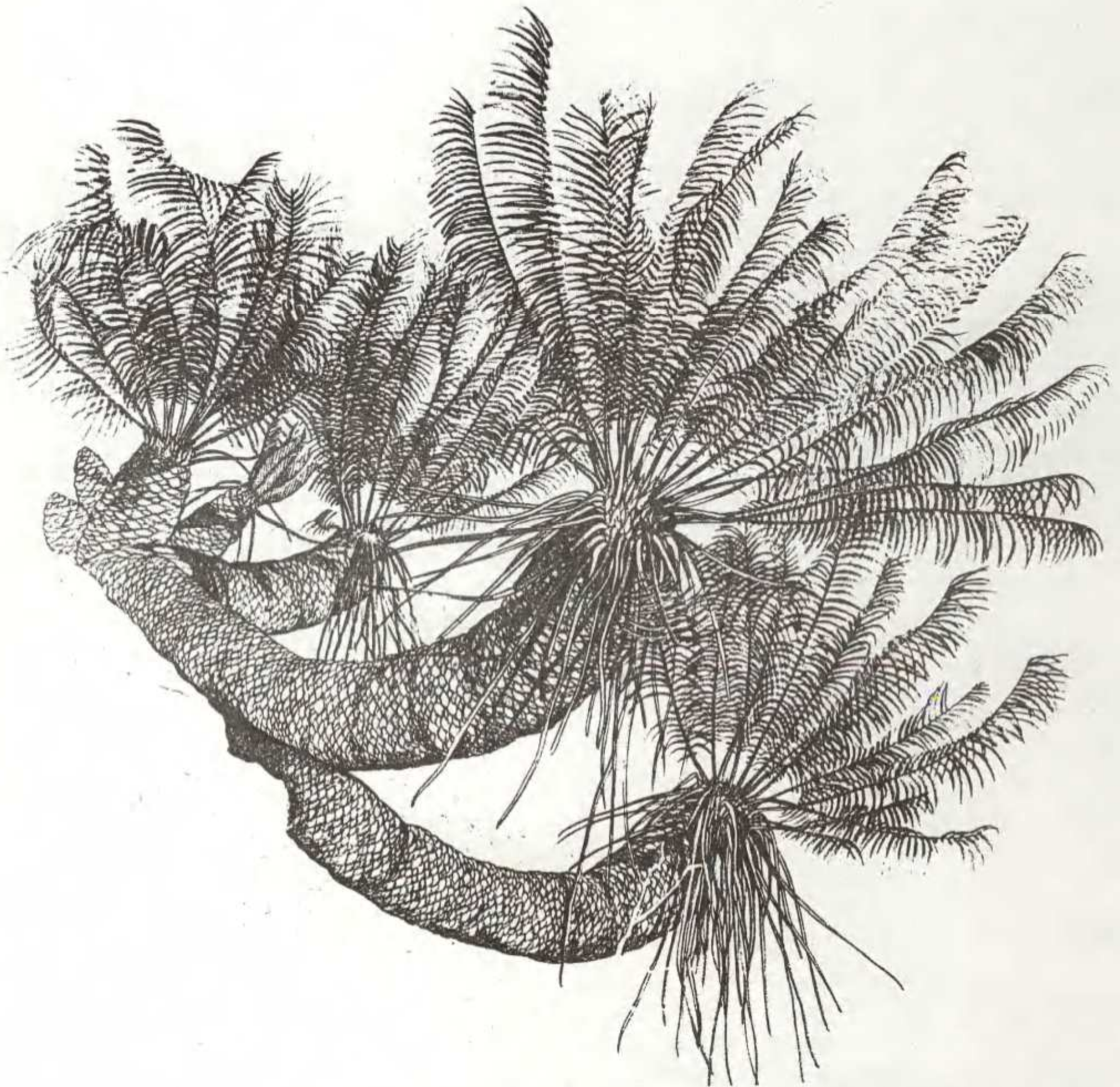
FOKUS OP ...

In each edition of ENCEPHALARTOS, we focus on one South African species, in the form of an indepth article in layman's language. In this edition the spotlight falls on:

In elke uitgawe van ENCEPHALARTOS fokus ons op een Suider-Afrikaanse broodboomspecies, in the vorm van 'n in-diepte-artikel in leketaal. In hierdie uitgawe val die kollyg op:

ENCEPHALARTOS INOPINUS

by Roy Osborne



A reproduction of the painting of *Encephalartos inopinus* used by Douglas Goode in his book "Cycads of Africa". Reproduced by permission of author and publisher.

1. INTRODUCTION

Those readers who have a copy of Douglas Goode's "Cycads of Africa" will appreciate the wisdom of the choice of cycad used to illustrate the slipcase and dustcover. It is a magnificent multi-stemmed plant, a fine example of a rare and sought-after species with the graceful qualities of a Mexican *Dioon* or the Cuban *Microcycas* - and "something different" from others of its genus. It is thus appropriate to pause for a while - as we focus, in this issue, on *Encephalartos inopinus*.

2. DISCOVERY

In 1955 the attention of a group of hikers in the Transvaal's Lydenburg district was caught by an unusual looking plant. One of the group, Dr Helmoed van Hoepen, removed a sucker from this specimen and replanted it in his Johannesburg garden. Here it flourished, but it was not until nine years later that it attracted the interest of botanists. In an effort to relocate the parent plant, a Mr C.A. Els, also a member of the original hiking group, set off in August 1964 with Dr L.E. Codd, Dr I.C. Verdoorn, Mrs E. van Hoepen and Dr R.A. Dyer. Unfortunately the original plant appeared to have perished - but a second specimen was found on a nearby sheer krantz along the Steelpoort River between Penge and the Kromellenboog asbestos mine. A local from the area told the party that there were three more plants in mountainous territory a little further to the east.

At that time, Drs Dyer and Verdoorn had been hard at work on their cycad survey and believed they had seen all possible species. This new finding, described enthusiastically by Dyer as "one of the major botanical discoveries in South Africa in recent times", was thus something of an "unexpected" bonus. [He expressed even further astonishment at the subsequent discoveries of *E. cupidus* and *E. heenanii* in the early 70's!] By curious coincidence, the farm on which the new plant was found was called "Onverwacht" and it was thus a natural choice for Dr Dyer to latinize the epithet in his 1964 description of *Encephalartos inopinus* R.A. Dyer.

Unlike the case with other species of its genus, the botanical description was published without its author having seen any cone material, apart from two damaged young male cones. In 1969, Transvaal Nature Conservation Officer G.J. Alberts completed a survey of the Olifants River area in which he was fortunate enough to find a new but scattered colony of *E. inopinus*. He was able to bring a female cone back for Dr Dyer's inspection. Male cone material was provided by a Mr C.T. Phillips of Verwoerdburg and, with this new evidence, Dr Dyer was able to complete the botanical description for the species in 1971.

3. DISTRIBUTION

E. inopinus occurs very sparsely, mainly in thick bush on north-facing steep slopes or rocky outcrops in the generally rugged terrain of the Olifants River catchment area in the self-governing state of Lebowa. The climate is simply "hot" and the rainfall ranges from a meagre 375 to 750 mm annually. Goode reports that only the occasional plant is tall enough to protrude through the bush cover but that there are some particularly fine specimens, with up to eight stems, hanging from inaccessible narrow ledges high up in one of the gorges.

Cultivated specimens of *E. inopinus* are recorded as being present in public collections at the Naples and Les Cedres Botanical Gardens in Europe; at the Foster Gardens in Honolulu and at the Fairchild Tropical Gardens in the continental USA; and at Ewanrigg Gardens in Harare. In South Africa, specimens are present in the collections at the National Botanical Institute and the University of Pretoria gardens in Pretoria, at the Lowveld Botanical Garden near Nelspruit, at Kirstenbosch and at the Durban Botanical Garden (regrettably, one of the Durban Botanical Gardens' specimens was stolen in 1986). Numerous field-collected plants, commonly referred to as "IPs", exist in the gardens of private collectors, both in this country and abroad.

4. DESCRIPTION

4.1 STEMS

The stems of mature *E. inopinus* plants are slender in diameter, at about 15 - 25 cm, and variable in length up to about 3 m. However, very old multi-trunked plants, like those in the Olifants River krantz, become procumbent and can reach as much as 4.5 m in length. The trunks sucker relatively freely. Cynthia Giddy comments that the stem is very characteristic with the different size leafbases resulting in a "patchwork" pattern.

4.2 LEAVES AND LEAFLETS

The foliage of *E. inopinus* is a fresh bluish-green colour and has a silvery bloom. Leaves are typically about 0.8 - 1.5 m long, depending somewhat on the degree of sunlight or shade to which the plant is exposed. The rachis is characteristically yellowish-green, more-or-less straight, but quite often with some upwards curvature and a slight twist towards the apex. In most specimens the leaves exhibit a pronounced bare petiolar section, up to about 20 cm in length. However, a lesser number of plants have leaflets which reduce progressively in size towards the leafbase and consequently have a much shorter petiole.

6. CONSERVATION AND CULTIVATION

The habitat population of *E. inopinus* has suffered much from the activities of collectors. In addition, Douglas Goode maintains that large troops of baboons in the area frequently damage the immature cones and that this possibly explains the absence of seedlings.

In terms of the Threatened Plant Unit's listing, *E. inopinus* is described as "endangered", sharing this unfortunate status with *E. cupidus*, *E. latifrons* and *E. laevifolius* and possibly one or two other species in South Africa. Estimates of the total number of plants presently occurring in habitat, and their specific localities, remain confidential at present.

As part of its conservation programme, the Transvaal Provincial Administration's nursery north of Pretoria grew over 200 plants from seed (gathered largely from cones borne on confiscated plant stock). It is hoped that all present owners will afford their co-operation in the Society's endeavours to pollinate all female cones and make seedlings available more freely so as to maintain and extend the existing *ex-situ* gene pool for this important species.

There is little information available on the optimum conditions for garden cultivation of "IPs". From casual observations I would suggest that, like so many of the members of its genus, a semi-shady position with good drainage would be most appropriate. Careful procedures should be followed when removing basal suckers to avoid rot setting in to either the parent plant or the suckers. The success achieved at the TPA nursery in propagation from seed adds weight to the concept that proper management of the combined resource of existing garden plants can lead to their greater availability.

7. REFERENCES

- DYER, R.A. 1964. Cycadaceae. *Encephalartos inopinus* R.A. Dyer sp. nov. *Bothalia* 8: 169-170.
DYER, R.A. 1965. The Cycads of Southern Africa. *Bothalia* 8: 405-515.
DYER, R.A. 1971. Zamiaceae. The cones of *Encephalartos inopinus*. *Bothalia* 10: 369-371.
DYER, R.A. & VERDOORN, I.C. 1966. Zamiaceae. *Flora of South Africa* 1: 3-34.
GILBERT, S. 1984. Cycads: status, trade, exploitation and protection 1977-1982. World Wildlife Fund, U.S.A.
GIDDY, C. 1984. Cycads of South Africa. 2nd Revised Edition, C. Struik, Cape Town.
GOODE, D. 1989. Cycads of Africa. Struik-Winchester, Cape Town.
LUCAS, G. 1980. The Botanic Gardens List of cycads. Interim Report, Royal Botanic Gardens, Kew.
OSBORNE, R., GROBBELAAR, N. & VINCENT, P.L.D. 1990. A numerical phenetic study of the genus *Encephalartos* Lehm. Poster presentation at the Second International Conference on Cycad Biology, Australia, July 1990.
VORSTER, P. 1987. Hybridization in *Encephalartos*. *Encephalartos* 10: 10-15.

8. ACKNOWLEDGEMENTS

I record my appreciation to Nat Grobbelaar for a critical reading of the first draft of this text. Unless stated otherwise, all photographs were taken by the author.

Although teeth are normally absent from the leaflet margins, occasionally minute teeth are found on the lower leaflet margins towards the apex. Leaflets are typically about 14 - 20 cm long and 8 - 12 mm wide. The fairly widely-spaced leaflets bend gracefully down under their own weight from the rachis so as to give a gentle "inverted V" appearance - a characteristic which adds much to its overall form. This inverted V leaflet arrangement is uncommon in the genus, the only other species showing this being *E. heenanii*, *E. paucidentatus*, *E. ghellinckii* and, to some extent, *E. cycadifolius*.

4.3 CONES

Male plants of *E. inopinus* bear, somewhat sporadically, up to 4 silvery green, rather pointed, cones. The cones measure about 18 - 25 cm in length by 6 - 8 cm at their widest diameter and have a peduncle of up to 10 cm long. Pollen is shed somewhat earlier in the year than in other species, typically in February.

The female plants bear, also somewhat sporadically, 1 - 3 barrel-shaped greenish-yellow cones with a whitish bloom. The cones are about 30 - 35 cm long by about 15 - 20 cm in diameter. Female cones have a very short stout peduncle completely surrounded by the bracts arising from the stem apex. Cones scales are somewhat unusual in being more-or-less the same size throughout the cone with only the few smaller sterile apical scales being smaller. The cone bulla and facet surfaces give a striking geometrical appearance to the structure as a whole. Seeds, which are shed some 6 months after pollination (i.e. about August), are pale orange in colour. They measure about 4 x 2.7 cm with the seed kernel having dimensions of 3.2 x 2.0 cm.

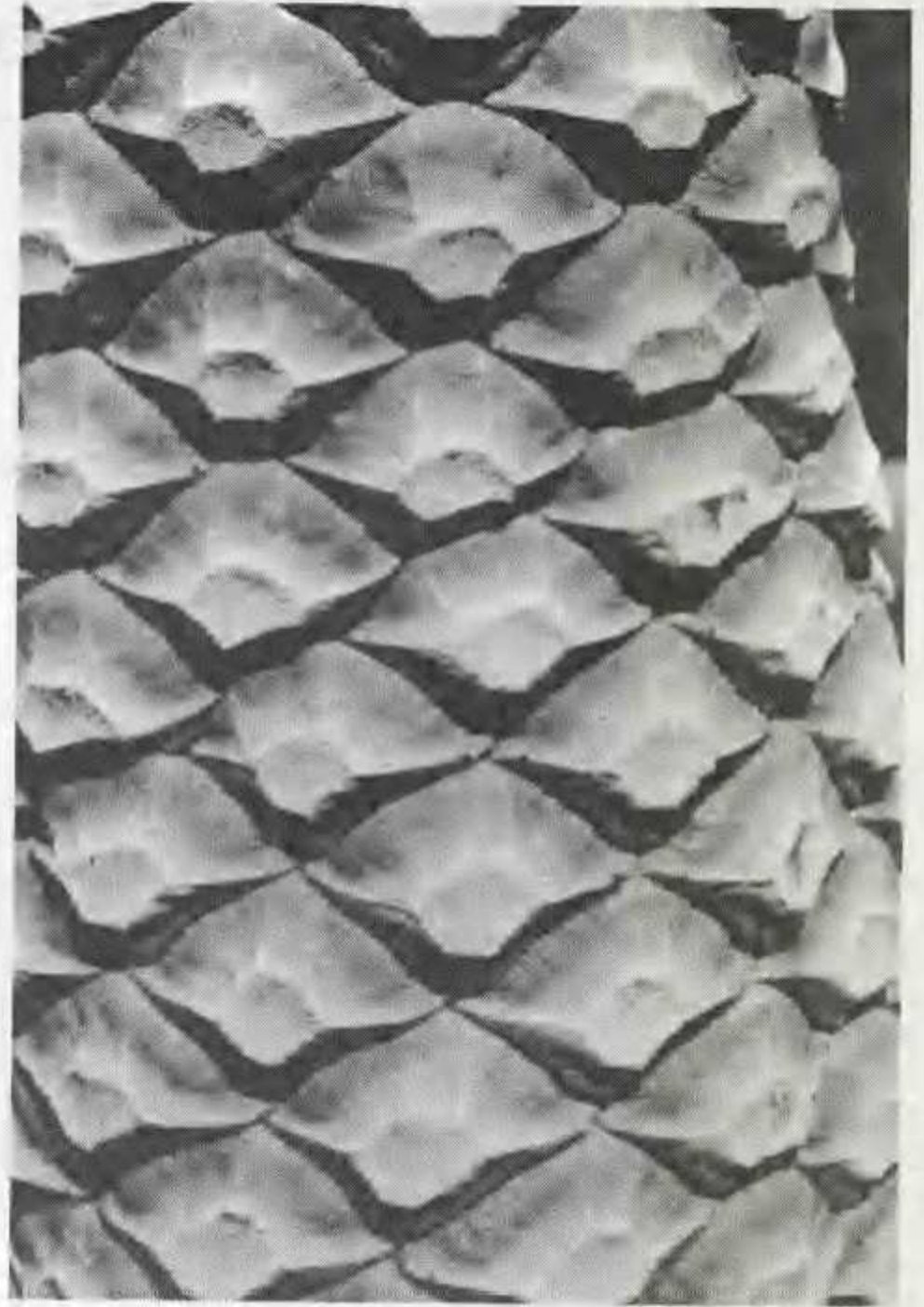
5. AFFINITIES AND HYBRIDS

In times before cycad collecting was fashionable, *E. dolomiticus* and *E. inopinus* grew in near proximity in habitat. However, no natural hybrids of these two species, or of "IPs" and any other species, have been recorded. Indeed, no artificial crosses have been publicised although Piet Vorster suggests that crosses between *E. inopinus* and *E. villosus* or *E. paucidentatus* could be particularly striking.

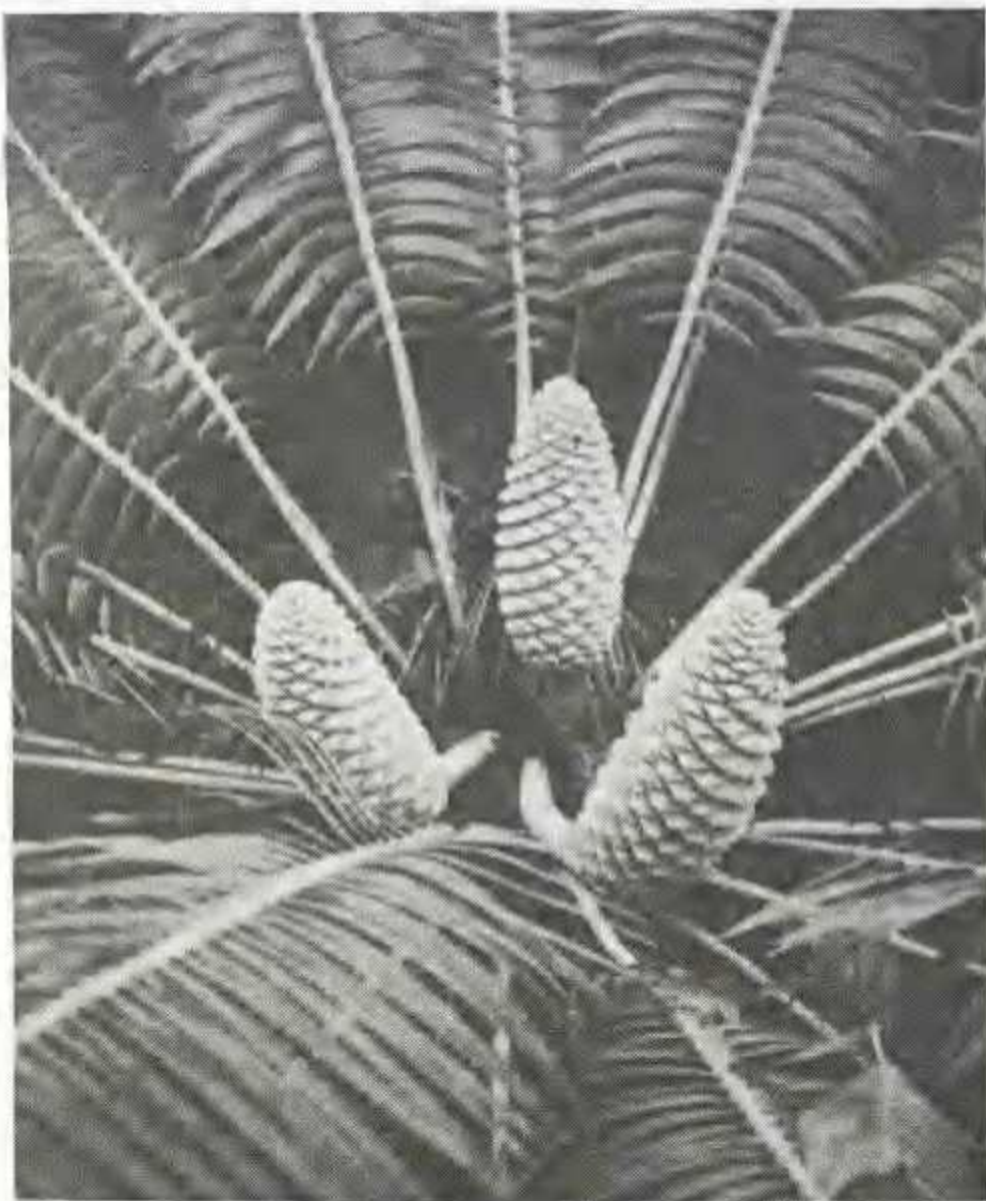
In terms of vegetative and reproductive morphology, *E. inopinus* shares its features only distantly with other species. Despite its superficial vegetative similarity to species of *Dioon* and *Microcycas*, it is certainly not more closely related to those genera than is any other *Encephalartos* species. The work by Osborne, Grobbelaar and Vincent, involving a multivariate statistical analysis of 86 different characters in the genus, places the species in a loose assemblage with *E. poggei*, *E. caffer*, *E. ngoyanus* and *E. cerinus* but more recent cladistic analyses suggest a closer affinity with the *E. eugene-maraisii* complex.



A female IP cone showing the more-or-less constant size of all scales except for a few near the apex.



A close-up view of a female cone of *E. inopinus* showing the regular geometric bulla and facet appearance in the spiral arrangement of the cone scales.



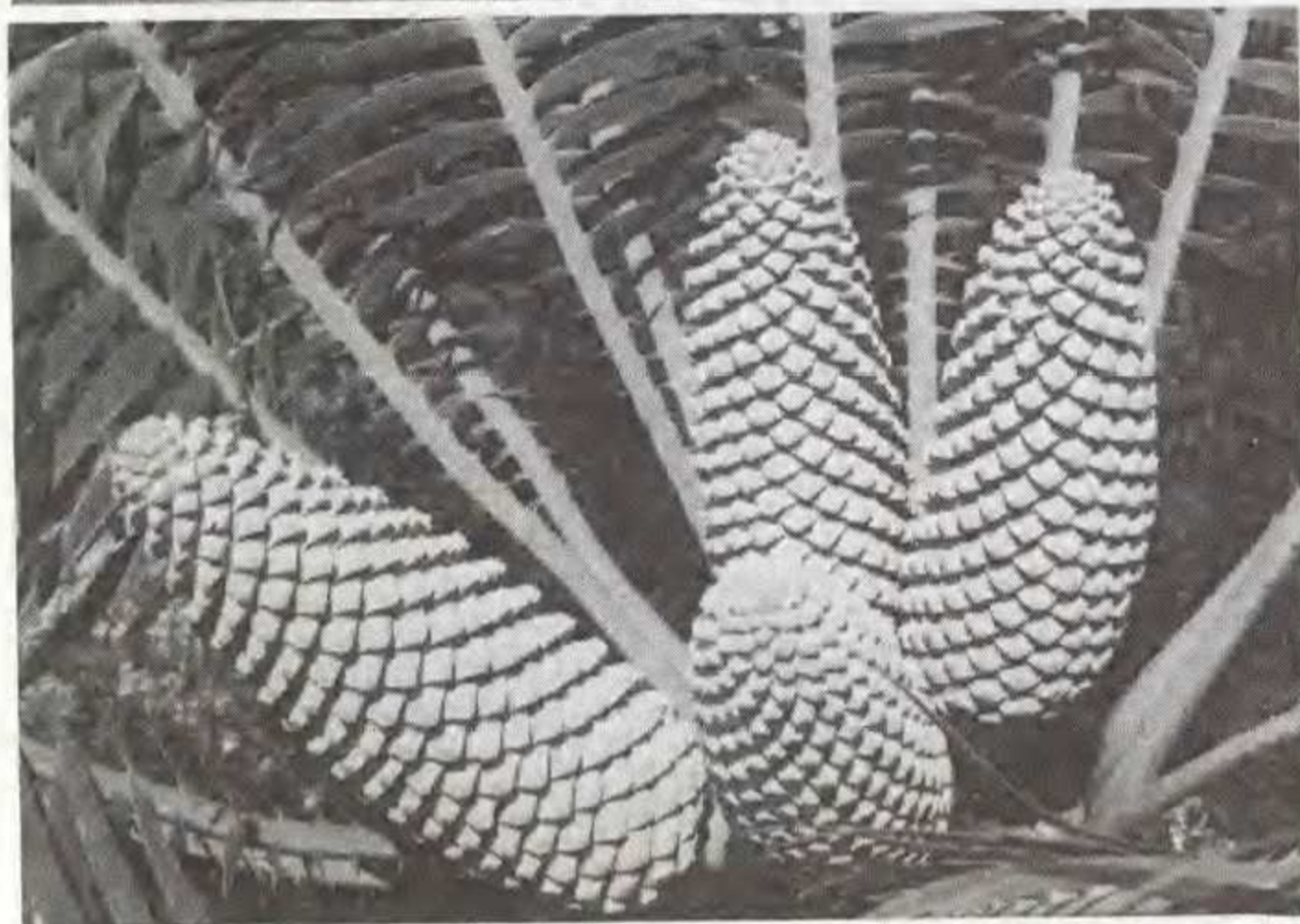
Male cones on an *E. inopinus* specimen at the Foster Garden, Honolulu, Hawaii. Photo: Leland Miyano.



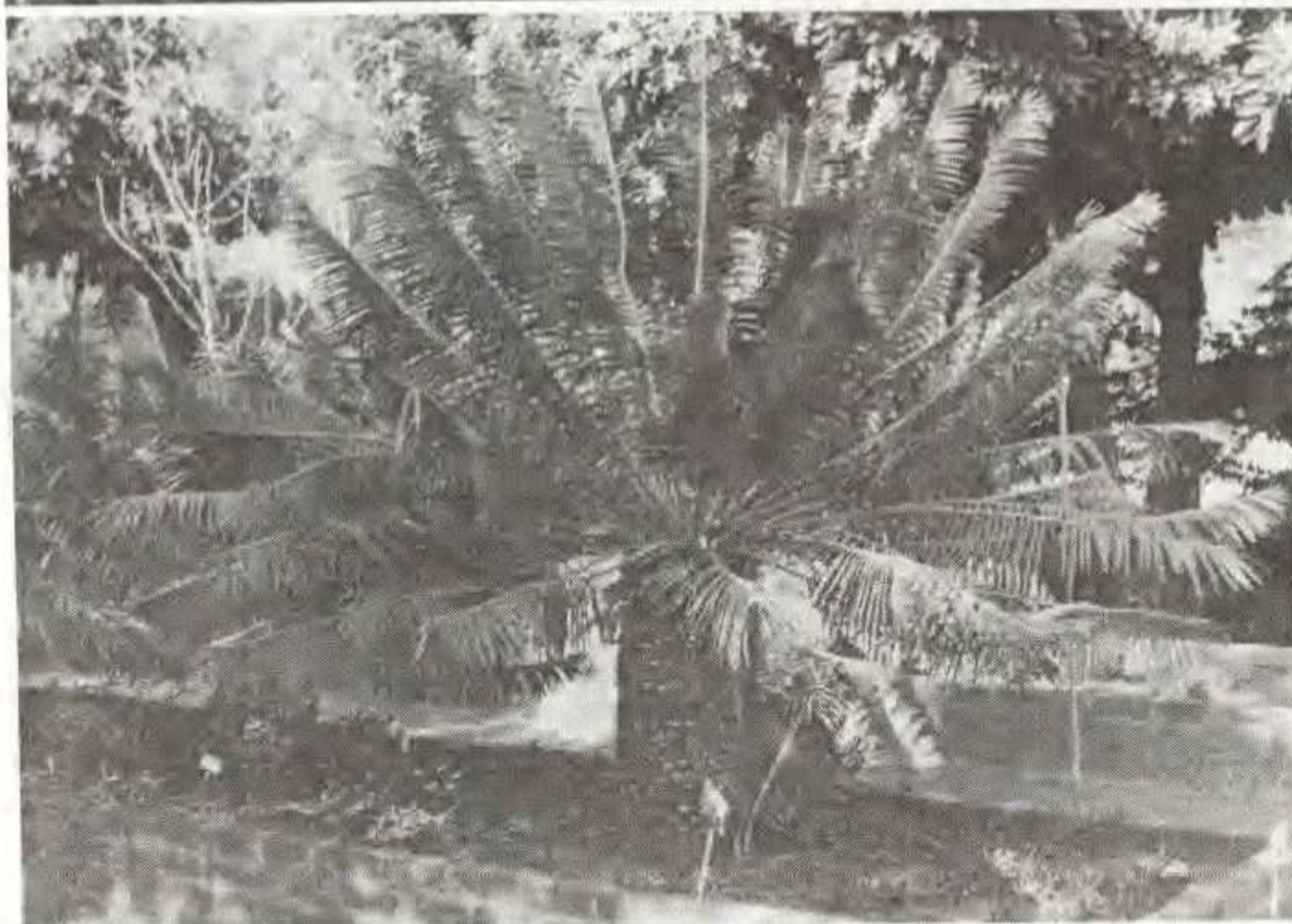
A group of *E. inopinus* seedlings at about the 2-year old stage, photographed at the TPA nursery, Pretoria, in July 1988.



An impressive group of large "IP" specimens in a private garden in Pretoria.



Male cones on a plant in a Pretoria garden. Note in this specimen that there is a progressive reduction in leaflet size towards the leaf bases and only a short petiole.



Confiscated plants of *E. inopinus* at the Transvaal Provincial Administration's Pretoria nursery. These plants are to be transferred to the Lowveld Botanic Garden at Nelspruit.

RESCUE OF A *E. NATALENSIS* TRUNK

The accompanying photographs shows how an abandoned trunk of *Encephalartos natalensis* was salvaged. Vic Bard, and his son Zac, enthusiastic members from the Natal South Coast, tell that they found this trunk "riddled with ants" and given up as dead, in a yard in Port Edward. The photos and captions tell the story.



Fig. 1: April 1990. The abandoned trunk shows much evidence of decay and little hope of recovery.



Fig. 2: The damaged tissue has been cut out and sealed. The central material had to be totally removed at the upper end.



Fig. 3: Several months later, two suckers appeared from the base of the trunk.



Fig. 4: One and a half years after planting, prolific sucker development at the base is supplemented by budding at the top.

NATAL PARKS BOARD CONSERVATION AWARD

The presentation of the Natal Parks Board's first Conservation Award was made to Mrs Cynthia Giddy, the well-known South African authority on cycads, at a function held at King's House in Durban recently. The announcement was made by Mr Botha, Administrator of Natal who handed over the award, a bronze of a white rhino crafted by Natal Parks Board artist, Mark Coetzee.

Mr Botha congratulated Mrs Giddy on her fine contribution to the conservation of Natal's natural heritage. "Mrs Giddy has given invaluable support to the Natal Parks Board in its efforts to control the illegal trade in indigenous cycads. By providing assistance where cycad collections need to be identified and recorded and by training officers to identify cycads, she has shown how valuable and essential it is for co-operation to be forged between the public and private sectors in the interests of nature conservation", said Mr Botha.

In accepting the award Cynthia said she felt that the award had really been given to Cycad Conservation and that she would like to pay tribute to the many people in the field of conservation who shared her concern for these ancient plants.

"We in South Africa are very privileged that we have more than a fifth of the world's living cycads in terms of species diversity, but in terms of numbers, our cycads are the most threatened in the world. Legislation alone will not save the cycads. I am convinced that the only thing that will save cycads from extinction is a new and more enlightened public attitude. An attitude that says no to the on-going plunder of a natural heritage. Cycads belong in the wild and should be safe there from human threat".

It is the first time that the award has been presented.

The event will henceforth be held annually when the award will be presented to a Natal based individual or organisation which, in the opinion of the members of the Natal Parks Board, has contributed significantly to conservation at a regional, national or international level.



From left to right: Dr George Hughes (Director Natal Parks Board) the Administrator of Natal, Mr Con Botha, Cynthia Giddy, Mr Dering Stainbank (Chairman of the Natal Parks Board).



The bronze sculpture of a white rhino which was crafted by Natal Parks Board artist Mark Coetzee.

WORLD CYCAD CENSUS

The data returns continue to flow in to the World Cycad Census, final results of which will be presented at the forthcoming CYCAD 93 Conference. All data must be finalized by the end of this year and any private collectors or officers at public gardens, who have not yet submitted their returns, are asked to do so as soon as possible. For those who do not have the standard response form, all that is required is (1) the name of the owner or the institution (2) a list of species of mature (coning size) plants which are present in the collection and (3) the number of male, female or plants of unknown gender for each species. Every additional report, even for small collections adds to the value of the overall data.

An interesting feature of the data so far is the number of gardens where large (>50 plants) stocks of any one particular species are held. In many cases, these gardens hold vital gene-bank resources, particularly for the rarer species. A growing body of opinion supports the view that the ownership of these *ex situ* collections carries with it a responsibility for their proper management; it is hoped that each of these collections is properly managed in terms of pollen collection, pollination, seed harvest and distribution programmes.

Some examples which illustrate these large holdings are:

- Disneyworld Gardens in Miami, USA has 105 specimens of *Cycas revoluta* and 57 of *Zamia furfuracea*.
- There are approximately 400 specimens of *Cycas taiwaniana* planted in the grounds of the Chinese Culture University, Taipei, Taiwan.
- The Pamplermousses Garden in Mauritius has 255 mature plants of *Cycas thouarsii*.
- There are 92 specimens of *Encephalartos ferox* in the Natal Parks Board's St Lucia Park office grounds.
- There are 186 *E. manikensis* specimens at Ewanrigg Gardens, near Harare, Zimbabwe.
- Despite a recent reduction of its holdings (to create space for other cycads) the Durban Botanic and Old Fort Gardens still have some 200 specimens of *Encephalartos villosus*.
- Fairchild Tropical Garden, Miami, Florida, has 85 accessioned specimens of *Zamia integrifolia*.

Roy Osborne, Secretary, World Cycad Census, 20 Maryvale Road, Westville 3630 South Africa

AUSTRALIAN CYCADS - A WORTHY CHALLENGE

By: CYNTHIA GIDDY

The Australian cycads have an undeserved reputation of being difficult to grow locally. Although I had a lot of problems originally and almost gave up on them as they never thrived and died off in large numbers, I discovered that the secret lay in patience and getting to know their cultural requirements - which is good advice for growing almost any cycads. Having visited Australia twice and seen all the New South Wales and Queensland cycads in habitat, the most valuable lesson I learnt, was that virtually every species grew in semi shade in light woodland conditions, mainly under eucalypts. However, it was not the familiar tall Eucalyptus grandis that we know in this country, but a variety of smaller growing and relatively sparsely branched species. These give a dappled shade and a variety of plants grow under them.

An examination of the soil showed that Australian cycads grew in a very sandy soil even those occurring 400-500 km inland. The exception being a stand of Cycas cairnsiana which grew amongst almost pure rock with hardly any soil visible. This will indicate that good drainage is a prerequisite for success with the Aussies. A study of rainfall patterns is important regardless of what plants you want to grow. Years ago when the Aloe mania was at its height we learnt that desert aloes such as Aloe dichotoma or Aloe variegata seldom survived more than a year or two when grown in tropical Natal, likewise winter rainfall aloes were not happy in the summer rainfall areas.

Nothing I have ever read, prepared me for the Queensland Rainforests in the north of this surprising continent. Here I saw 2m high Bowenia spectabilis leaves emerge from the moss covered forest floor and realised why they were so unhappy in Umlaas Road, Natal. Back home I put them under 3 layers of 40% shade cloth and watered them copiously. Its hardly the Daintree State Forest, but they are looking very good.

They make spectacular house plants that never fail to elicit comment. I will only sell one if I have a written undertaking that it will live in a bathroom. Plants also need a Bill of Rights.

Growing socially with the Bowenia spectabilis are the tallest known cycads Lepidozamia hopei. The trunks of these can reach 20 meters as they reach out to the light. Glossy, dark green leaves which are not as numerous as those of Lepidozamia peroffskyana, makes this a must for the tropical areas of Natal and possibly even the Eastern Transvaal. However I doubt whether they will be happy on the Highveld unless grown indoors in an atrium which could provide the shade and humidity they demand. Their more accommodating cousin Lepidozamia peroffskyana, is a fast growing fountain of green somewhat reminiscent, but more leafy than our Encephalartos villosus. Four year old plants already have leaves 1.5m. This species will tolerate all but the worst of the Highveld frosts as it grows from coastal Seven Mile Beach to fairly inland at Dorrigo. This is my number one choice of the Australians.

The Macrozamia fall into two groups, the dwarf ones with leaves under 60cm and those with longer 1 - 1,5m leaves. Amongst the former group, Macrozamia fawcettii and Macrozamia pauli-quilielmi are the most rewarding and they will make splendid edging plants or you should consider planting a group of 3-5 in a clump. The rest of the Parozamia are curious and of interest mainly to collectors who are playing the numbers and names game. eg. "I have all 11 different Parozamia and I can now tick them off on my World List." With all apologies to my Australian friends, some of the parozamia are an apology for a cycad. Neither did they grow much better Down Under.

Macrozamia communis, Macrozamia miquellii and Macrozamia johnsonii are most robust and splendid garden subjects. In the wild they almost rival Wordsworth's daffodils "Ten thousand saw I at a glance". The kilometers of Macrozamia communis lining the road to Bateman's Bay and South Durras are in terms of sheer numbers, one of the most unforgettable cycad sights in the world. Likewise do the stout trunks of Macrozamia moorei at Springsure, looking for all the world like a grove of Phoenix canariensis, remain in the memory. These larger growing Macrozamias are very worthy garden subjects and are not only fast growing with 1,5m leaves after 5-6 years, but Keith Boyer of New Zealand has coned a Macrozamia communis in 8 years from seed.

It is interesting that the juvenile leaves of Macrozamia miquellii differ markedly from the mature leaves and at about leaf number six a robust dark green adult leaf with yellow hinges will push through the feathery pale green seedling leaves. Macrozamia communis, Macrozamia johnsonii and Macrozamia miquellii should be freely watered as they occur in high rainfall woodland.

I found that the new leaves on my 2-3 year old seedlings frequently bunched up and failed to emerge out of the crown. Extra attention to watering has now solved that problem and 2-3 year old seedlings of Macrozamia johnsonii often have 6-7 leaves of 70-80cm. This species has feathery soft leaves and is a welcome foil to the more leathery leaved Encephalartos. Macrozamia reidleyi from Western Australia is another handsome plant but one of the few winter rainfall cycads and this fact should be taken into account when growing them in a summer rainfall area.

With the exception of the Lepidozamias and one or two of the Macrozamias, the cones of the Australian cycads are not as large or vividly coloured as those of the Encephalartos. A notable exception is Macrozamia lucida.

Not only are they a brilliant gold as the name indicates, but they produce large numbers of them. A single male plant of Macrozamia lucida had no less than 16 cones at ground level. The Cycas often have mature and immature seeds representing two coning seasons simultaneously on the plants.

Macrozamia macdonellii has a strange fascination for cycad collectors. Not only is it geographically isolated in that it grows thousands of kilometers distant from all other cycads in the centre of the Australian desert at Alice Springs, but it grows in possibly the driest cycad locality in the world. Annual rainfall is less than 200mm. The leaves are a brilliant blue and the enormous seeds are the largest of any cycad. This is probably an adaptive mechanism to give the seedlings a good start in life in that arid climate. As a garden plant Macrozamia macdonnellii is fast growing and thrives in full sun. Needless to say good drainage is a prerequisite, but after that you can turn the sprinklers on.

The Australian Cycas are probably the main reason why Australian cycads have in the past had such a bad reputation. Unlike the ubiquitous Cycas thouarsii and Cycas revoluta which thrive in every garden, the Australian Cycas are very fussy and demanding. They don't just sulk, they turn up their toes and die with a total disregard for their puzzled owner who had treated them just like their other Cycas cousins revoluta and thouarsii.

A rudimentary appreciation of Australian climatic conditions is necessary to grow them successfully. The New South Wales Cycas species such as Cycas media and Cycas kennedyana are marginally easier, but no Australian Cycas will make life easy for you. Germination rates from seed are in the high 90's, but then your problems begin. The first leaf emerges rapidly, takes a good look at this cruel world and the seedling joins its ancestors. The most common cause is that the radicle rots on entering the soil.

I have tried every possible soil mix from coarse bark for the air filled porosity factor to fine, medium and coarse sand. Needless to say sterile media were used to exclude any fungal infections. Seeds were germinated singly in containers to avoid transplant shock.

A small percentage will survive the first few months and then as soon as the first seedling leaf turns yellow, all watering must be withheld for almost 6 months to stimulate the "wet" and "dry" seasons. An Australian visitor suggested that the missing factor was high temperatures. The most difficult Cycas species are those from the area around Darwin, where the average daily temperatures are 36 deg C in the summer and 30 deg C in winter with an annual summer rainfall of 1200mm. The answer therefore is a hot, wet summer and a hot, dry winter. Low winter temperatures may be the reason for their high mortality as seedlings with us.

However it is worth persisting as these Northern Territory Cycas are spectacular when mature. Cycas furfuracea with its silvery blue tomentose leaflets which slowly unfurl as they mature are amongst the most beautiful of all cycads. Once the stems reach 8-10 cm in diameter a full crown of leaves will emerge every year. It is important to segregate them from cycads that are watered year round. This will be easier if they are grown in containers where they can be stacked under cover and kept dry during their six months deciduous period. Several of our Encephalartos species in the seedling stage also have a deciduous habit eg. Encephalartos caffer, Encephalartos nqoyanus and Encephalartos laevifolius, but they will die off if watered unseasonally. It is more likely that the deciduous stage in these species is triggered by cold weather and not by dry conditions.

It has been suggested that the Australian Cycas species are very susceptible to the various eelworm strains we have in this country. Should you have an eelworm problem it might be advisable to grow them in containers of sterilised soil rather than in the garden.

At this stage I am researching the PH requirements of the various species in their natural habitats. It is possible that certain trace elements and minerals in the soil may be the missing factor. Species occupy very specialised ecological niches and it would be presumptuous to expect that all species would thrive in an alien situation let alone a different continent.

The above comments are based on my experience in growing Australian cycads. Further comment would be welcomed, particularly reports of success in cultivating the different Australian Cycas species.

Cynthia Giddy
P O Box 45
P O Umlaas Road
3730 Natal

Tel: (0332) 510478



Cycas kennedyana growing at Mount Morgan, south of Rockhampton. The **1** older leaves are shed before the new ones emerge. Note the leaves that have dropped at the base of the trunk.



Bowenia spectabilis makes an outstanding house plant and **2** thrives under low light conditions. With reasonable care the coning stage is reached after 4 years.



Lepidozamia peroffskyana is a robust grower, an 8 year old plant will have a crown of 20-25 two meter long leaves. **3**



Macrozamia macdonellii in the foreground with *Lepidozamia peroffskyana* behind them growing under the dappled shade of *Ginkgo biloba*. **4**



*Macrozamia
secunda* Mudgee,
New South Wales

The following photos of the MACROZAMIA PARAZAMIAS were taken by Brian Laughland of New Zeland when he toured Australia in 1989.



*Macrozamia
platyrachis*
Blackdown
Tableland,
Queensland



*Macrozamia
stenomera*
Narrabri, New
South Wales



*Macrozamia
heteromera*
Loonabarabran,
New South Wales



*Macrozamia
pauli-guilielmi*
ssp. flexuosa
Hexham, New
South Wales



*Macrozamia
fawcettii* Loff's
harbour, New
South Wales

THE CYCAD COLLECTION AT THE NAPLES BOTANICAL GARDEN

by Roy Osborne

The results from the current World Cycad Census shows that the Naples Botanical Garden - *Orto Botanico di Napoli* - is firmly entrenched as the world's leading cycad garden, both in terms of the number of plant specimens and the number of species represented. In close association with Naples University's Botany Department - *Dipartimento di Biologia Vegetale della Università degli studi di Napoli Federico II* - the institution has also established an international reputation for excellence in cycad research.

Situated on a 12-ha site, the Orto Botanico is an oasis in the busy city of Naples, a large cosmopolitan metropolis on the western coast of southern Italy. The area experiences a mild Mediterranean climate and many cycads grow well outdoors with only minor shelter requirement during cold winter spells. The major portion of the collection, including all tropical species, is maintained in containers in a heated glasshouse complex. Apart from the cycad collection, the gardens have a wide and diverse selection of Angiosperms, other gymnosperms and vascular cryptograms and the annual summer visits by some 25 000 students (on conducted tours), testify to the educational role played by the organization.

The cycad collection commenced in 1809 with the acquisition of a specimen of *Encephalartos altensteinii*; this specimen produced two male cones in 1864 and has continued coning regularly to the present time. The second acquisition was that of a female specimen of *Cycas revoluta*, imported from Japan by Queen Carolina of Naples (Sister of Napoleon Bonaparte) in 1813. This specimen long outlived its donor but died in 1905. Several other specimens were obtained in the decades following but unfortunately the records of these acquisitions are incomplete. It is known, however, that by 1845 nine species and three genera (*Cycas*, *Encephalartos* and *Zamia*) were represented in the garden.

During the mid- to late 1800's, specimens of *Encephalartos horridus*, *Dioon edule* and *Zamia muricata* were obtained and a male sucker of *Cycas revoluta*, donated by Pisa Botanical Garden, allowed the first breeding pair to be constituted. Pollination is artificially carried out when possible and this year the staff proudly demonstrated their successful pollination of *Encephalartos umbeluziensis* where both parents were garden stock.



The central research headquarters of the Dipartimento di Biologia Vegetale in the Orto Botanico, Naples, Italy.

The collection was reorganized in 1965 under the guidance of Prof. Aldo Merola (after whom *Dioon merolae* was named). Addition specimens were obtained and the genera *Ceratozamia* and *Macrozamia* became represented. The philosophy was broadened to become interactive with other major botanical gardens throughout the world, and with the growing concept of the importance of *ex-situ* cycad collections as a gene bank. In addition, the plants provided research material for major advances in cycad biology.



Dioon edule female plant in cone; growing in a container sunk into the ground in an outside planting in Orto Botanico di Napoli.

From 1966, a vigorous effort to purchase stock was commenced. By special authorization, 193 specimens of 32 spp. of *Encephalartos* and 15 specimens of *Stangeria eriopus* were purchased from South African nurserymen. Similarly, since 1974 the gardens have purchased 83 specimens of all known species of *Macrozamia*, 25 specimens of *Bowenia*, 12 specimens of *Lepidozamia* and 50

specimens of 9 spp. of Australian *Cycas*, these all field-collected by special commission. Apart from these acquisitions from habitat stock, other purchases were made of cultivated specimens of *Cycas*, *Dioon*, *Encephalartos* and *Macrozamia*.

In contrast to these purchases, the Orto Botanico has been able to increase its collection further by many generous donations from private sources and public institutions. An example was the donation in 1973 by a Catholic Mission of two specimens of *Encephalartos laurentianus* collected on the Zaire-Angolan border. Similarly, in 1976 the Botanical Garden of Havana donated a specimen of *Microcycas calocoma*. A major addition to the collection was the bequest of 102 plants, representing 59 spp. in 8 genera, from the estate of Prof. Luigi Califano (after whom *Dioon califanoi* was named) in 1976. Further donations, from the Botanical Gardens of Puerto Rico and from Fairchild Tropical Garden in Miami, much extended the *Zamia* representation. In the late 1970's, a bequest from Prof. Angelo Verga allowed the garden to obtain several other important plants, including a magnificent specimen of *Encephalartos woodii*.

From 1969 to the present time research staff, at the Orto Botanico and at other Italian institutions, commenced a number of field trips during which valuable information and live plant material of many central and south American cycads were obtained. In 1975, *Cycas* specimens were collected on a field trip to Indonesia and Thailand. This new material has allowed considerable progress to be made in phytochemical, systematic and anatomical studies, particularly of the New World taxa. The extensive work on the genus *Dioon*, including the descriptions of *D. califanoi*, *D. caputoi*, *D. holmgrenii*, *D. merolae*, *D. rzedowskii* and *D. tomasellii*, is especially noteworthy. Current initiatives include taxonomic, cytological, biochemical and molecular biological cycad-oriented projects.

This article was written at the Naples Botanical Garden during a research visit by the author in May 1992. The kind assistance of the Orto Botanico staff is acknowledged.

The very extensive collection of *Dioon* specimens in the Orto Botanico glasshouses. Many of these field-collected specimens are now producing cones.



An impressive planting of *Cycas revoluta* in the Orto Botanico gardens.

References:

VALLARIELLO, G. 1985. Le Cycadales dell' Orto Botanico di Napoli. *Natura e Montagna* 32: 19-29.

DE LUCA, P. 1990. An Historical Perspective on Cycads from Antiquity to the Present. *Memoirs of the New York Botanical Garden*. 57: 1-7.

DE LUCA, P. 1992. L'Orto Botanico dell' Università di Napoli. In Raimondo, F.M. (ed.) *Orti Botanici, Giardini Alpini, Arboreti Italiani*. Stass, Palermo. pp 123-134.



EUDLO CYCAD GARDENS

Peter & Clare Heibloem
Ilkley Road, Eudlo, Queensland, Australia
Phone & Fax (074) 450 496

Correspondence to:
P.O. Box 700, Nambour, Qld. 4560

Peter and Clare Heibloem, of Eudlo Cycad Gardens,

would like to correspond with serious collectors interested in exchange of the rarer species of encephalartos, dioons, cycas and zamias. Export and import documentation can be arranged for artificially propagated specimen plants. Some interesting seed is also available for exchange.

Peter would like to visit and meet collectors when he visits South Africa for the 1993 conference (please write) and welcomes overseas visitors to Australia wishing to inspect his extensive cycad gardens.

Fax/Phone (074) 45 0496

CHERRY'S BIRD SANCTUARY



custodes
naturae

P.O. Box 250
Randfontein
1760

(011) 693-3267

Deon and Myrna Barnard who own Cherry Bird Sanctuary are in the market for something most unusual! They want infertile seed, yes all those floaters that most of us throw away. They are conducting a series of experiments in respect of the germination of the indigenous *Encephalartos* species.

Deon and Myrna will take as much as possible and are prepared to reimburse all senders for postage and packing.

CYCAD 93

THE THIRD INTERNATIONAL CONFERENCE ON CYCAD BIOLOGY

Pretoria, South Africa : 5-9 July 1993

*-Hosted by The Cycad Society of South Africa-
and held under the auspices of the IUCN's Cycad Specialist Group*

With less than a nine month gestation period, the CYCAD 93 Organizing Committee is in full gear with planning the Conference arrangements. Responses in hand at the time of writing indicated that over 160 delegates and accompanying persons would be attending the meeting including a strong representation from Australia (40) and the USA (32). Most overseas visitors will be participating in the pre- and post-Conference field trips and present indications are that 78 paper and poster presentations will be delivered.

Any persons interested in attending CYCAD 93 who have not yet responded to the preliminary announcement must contact Conference Chairman Nat Grobbelaar immediately. In view of the size and complexity of the event, late registrations cannot be accepted.

Conference Chairman: Nat Grobbelaar, P O Box 15357, Lynn East, 0039.

CYCAS POLLINATION

by Stan Walkley

Knowing when to pollinate a female *Cycas* successfully requires the grower to keep a constant eye on the emerging cone. Pollen may be applied at any time after the cone begins to "open" is when it bears a strong resemblance to a *Protea* flower.

The female cones appear to be at their most receptive within 3 to four days after this opening stage, but will remain receptive for up to three weeks. To achieve pollination, I usually hold the pollen-bearing male cone (which has been carefully collected from the male plant just as the pollen begins to fall) over the top of the female

cone and tap or shake the pollen into the open cone. My experience has been that the earlier the females are pollinated after becoming receptive the higher the seed yield. Once pollination has taken place, the female cone rapidly closes.

Stan Walkley writes from: Australian Rare Palm Supplies, Buckley Road, Burpengary, Queensland 4505, Australia.

*Roy Osborne has provided the sequence of photographs to illustrate Stan Walkley's comments with respect to a cone of *Cycas revoluta*.*

POLLINATION AND 'CONE' DEVELOPMENT IN *CYCAS REVOLUTA*.
Photographs by Roy Osborne

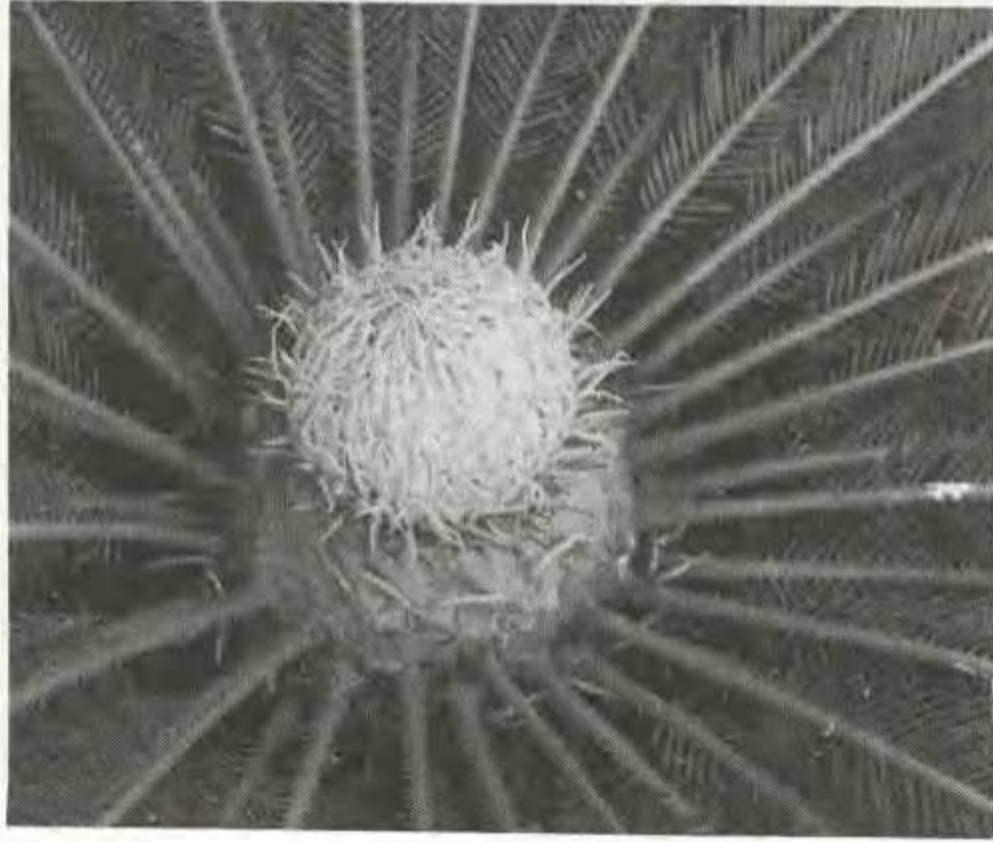


Figure 1: An early stage in development, soon after emergence of the female "cone". The megasporophylls are white in colour, rigid and tightly packed together.

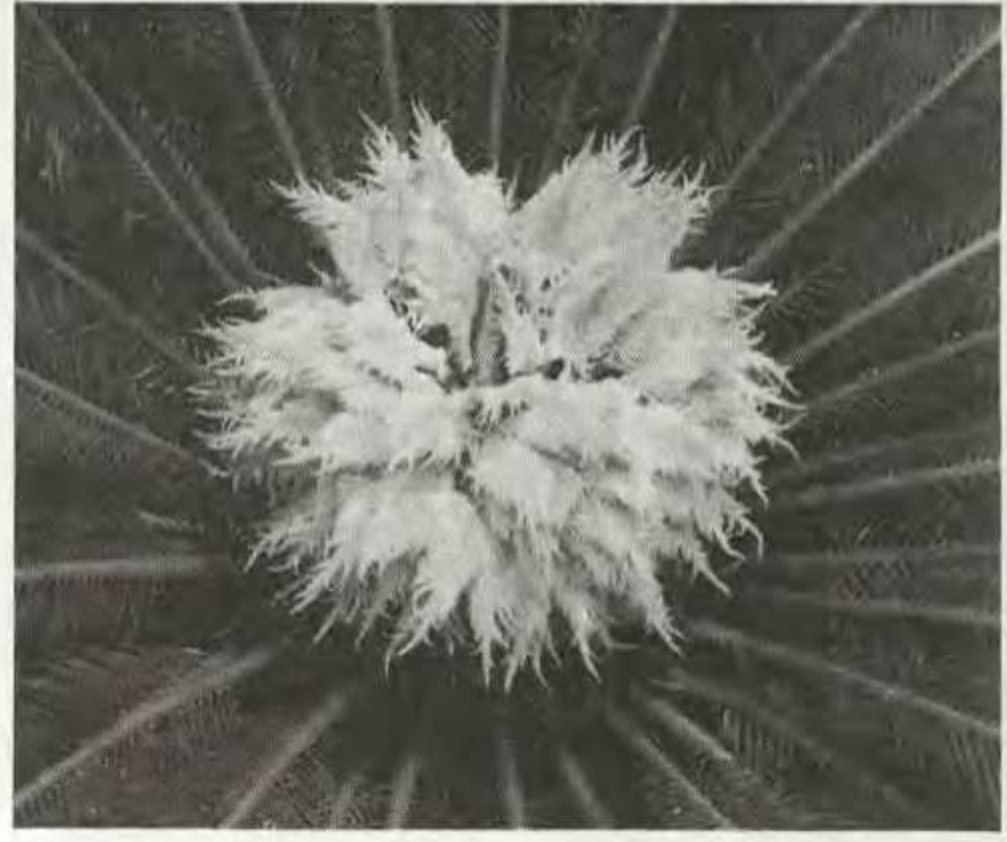


Figure 2: Ten days later, the megasporophylls have increased in size, are soft to touch, and opened outwards to give the structure Stan Walkley likens to a *Protea* flower. This is the stage at which pollination is successful.



Figure 3: 25 days after Figure 1. The megasporophylls have closed inwards again and are slightly stiffer than previously. It is too late to pollinate at this stage.



Figure 4: 75 days after Figure 1. The whole structure is much larger, megasporophylls are now tawny-brown in colour and the bright orange of the seeds can be seen. Seeds are harvestable about two months after this stage.

ODD CYCAD GROWTHS

From time-to-time cycad specimens put out odd growth structures; some instances have been reported in previous issues of this magazine (ENCEPHALARTOS 11:16, 12:4, 13:18-19, 14:20, 19:53, 22:23, 26:34-36, 28:19 and 29:7,25). Two further photographs have been submitted.



[Above] Our editor **Neil Munro** has noticed a vegetative bud about halfway up the stem of a plant of *Encephalartos inopinus*. Although this plant suckered profusely at the base, the stem bud failed to develop further.

[Left] Member **Leon van Rooy** of Nelspruit reports an anomalous cone structure which emerged amongst leaf bases of a specimen of *Encephalartos lebomboensis*.

NATAL SECTION NEWS

The April 1992 meeting of the Natal Section saw an enthusiastic group of about 40 members and friends gather at the Westville venue. Ann Lambert, Assistant Curator of the Durban Botanic Gardens, presented an illustrated lecture on "Landscaping with Cycads" providing much useful information on how to arrange garden plantings with respect to size, texture, colour, shape and growth habitats of cycads and associated plants. Cycad artist Douglas Good followed by describing a new project in which he is producing limited editions of cycad prints using a variety of processes, including the fascinating stone-litho technique. He showed examples of his work which will be part of a National Exhibition later this year.

The Natal Section Committee is thanked for the splendid catering and refreshments provided at the meeting.

IN MEMORIAM : BRUCE BURSEY

We record with deep regret the death of Bruce Bursey on 11 May 1992. Bruce was a dynamic and influential personality on the South African cycad scene for many years and our many readers that knew him will remember his passionate interest and profound knowledge, particularly of the Eastern Cape cycads. "Lowlands Nursery" was respected locally and internationally for its service. Bruce was also well known for his involvement with and many contributions to the Eastern Cape farming community and for his sportsmanship. The President, Council and members of the Society hereby express sincere condolences to Joan and family on the loss of a true gentleman and an outstanding friend.

ODD CONING IN ZAMIA

Further to the various reports of odd sexual and vegetative structures in cycads. We have received a photograph of a *Zamia* plant growing at Longwood Gardens, Pennsylvania, USA, which bore a more-or-less usual female cone but then proceeded to extend its axis into a male cone!

The photograph, taken in 1980, was supplied by Douglas Daly, Assistant Curator, New York Botanical Gardens.

Right: The *Zamia* plant at Longwood Gardens with a female cone and an apical male cone on the same cone axis.



NEW SCIENTIFIC REPORTS

Davis, A.J., Hursthouse, M.B., Montevalli, M., O'Brien, P. and Nunn, P.B.

1991. The crystal structures of two plant non-protein neurotoxic amino acids. *Phytochemistry* **30**: 3635-3638.

[One of the two structures described by the authors is that of L- α -amino- β -methylaminopropionic acid = β -methylamino-L-alanine or BMAA, as detected in several *Cycas* species.]

Author's address: Dept of Chemistry, University of London, Mile End Road, London E1 4NS, England.

De Luca, P. 1992. L'Orto Botanico dell'Università di Napoli. In: Raimondo, F.M. (ed.), *Orti Botanici, Giardini Alpini, Arboreti Italiani*, Stass, Palermo.

[The history and present status of the Naples Botanical Garden is described.]

Author's address: Orto Botanico, Via Foria 223, Napoli, 80139 Italy.

Terrazas, T. 1991. Origin and activity of successive cambia in *Cycas* (Cycadales). *American Journal of Botany* **78**: 1335-1344.

Author's address: Department of Biology, University of North Carolina, Chapel Hill, NC 27599-3280, United States of America

Pant, D.D. and Singh R. 1991. Unusual orthotropous germination in seeds of *Cycas rumphii* Miq. and the morphological nature of cycad coleorhiza. *Plant Science Series Bulletin* **2**: 1-7. [Some field-collected seeds of *Cycas rumphii* germinated with the stem apex and first leaves emerging from the chalazal end instead of at the micropylar end of the seed.]

Author's address: Dept of Botany, University of Allahabad, Allahabad, 211002 India.

Pant, D.D. and Das, K. 1991. Pinnae of *Stangeria eriopus* Nash. *Plant Science Series Bulletin* **2**: 23-25. [Resemblances between the form, venation and midribs of *Stangeria* pinnae and certain fossil specimens are discussed.]

Author's address: Dept of Botany, University of Allahabad, Allahabad, 211002 India.

Carpenter, R.J. 1991. *Macrozamia* from the Early Tertiary of Tasmania and a study of the cuticles of extant species. *Australian Systematic Botany* **4**: 433-444.

[A new fossil *Macrozamia* from Tasmania is described; studies of the cuticles, particular stomata, of fossil and living species are discussed and comment is made on the palaeoecology of *Macrozamia*.]

Author's address: Dept of Plant Science, University of Tasmania, GPO Box 252C, Hobart, Tasmania, 7001 Australia.

The cycad conundrum

Last month Julie Lake reported on new research on cycads and their toxins by Professor Alan Seawright and the Mayo Clinic. This month she talks to grower Tom Turner about his reaction to popular media coverage of the research and the concern it is causing in the industry

Brisbane's Tom Turner is vice president of the Southern Queensland Group of the Palm and Cycad Society of Australia. He has been co-operating with Dr Leonard T Kurland of the Mayo Clinic, and the University of Guam-Mayo Clinic project, investigating the ecology of *Cycas circinalis* in Guam. He is also an importer, nursery propagator and collector of palm and cycad seeds.

Tom Turner is concerned about the adverse effects generated by some media reports of Prof Seawright's research and advises both members of the public and those growing or selling cycads to keep a sense of proportion about the whole matter.

To this end, and in the hope of dispelling some of the misinformation about cycads including the media reports confusing them with palms and suggesting indoor pot plants may be toxic, he has provided the following information about cycads.

'Cycad' he says is a collective term for primitive non-flowering plants within a group known as the

Cycadales, often palm-like in appearance on account of their divided frond leaves. Despite this they are in no way related to palms and, in fact, as non-flowering plants are more closely related to conifers where naked ovules are fertilised with pollen from male cones.

Origin of cycads

Modern cycads had their ancestral origins in the time of the dinosaurs about 180 million years ago and they, together with now extinct related groups, dominated the plant kingdom until about 70 million years ago when the first flowering plants emerged to overtake this and other ancient orders of gymnospermous plants.

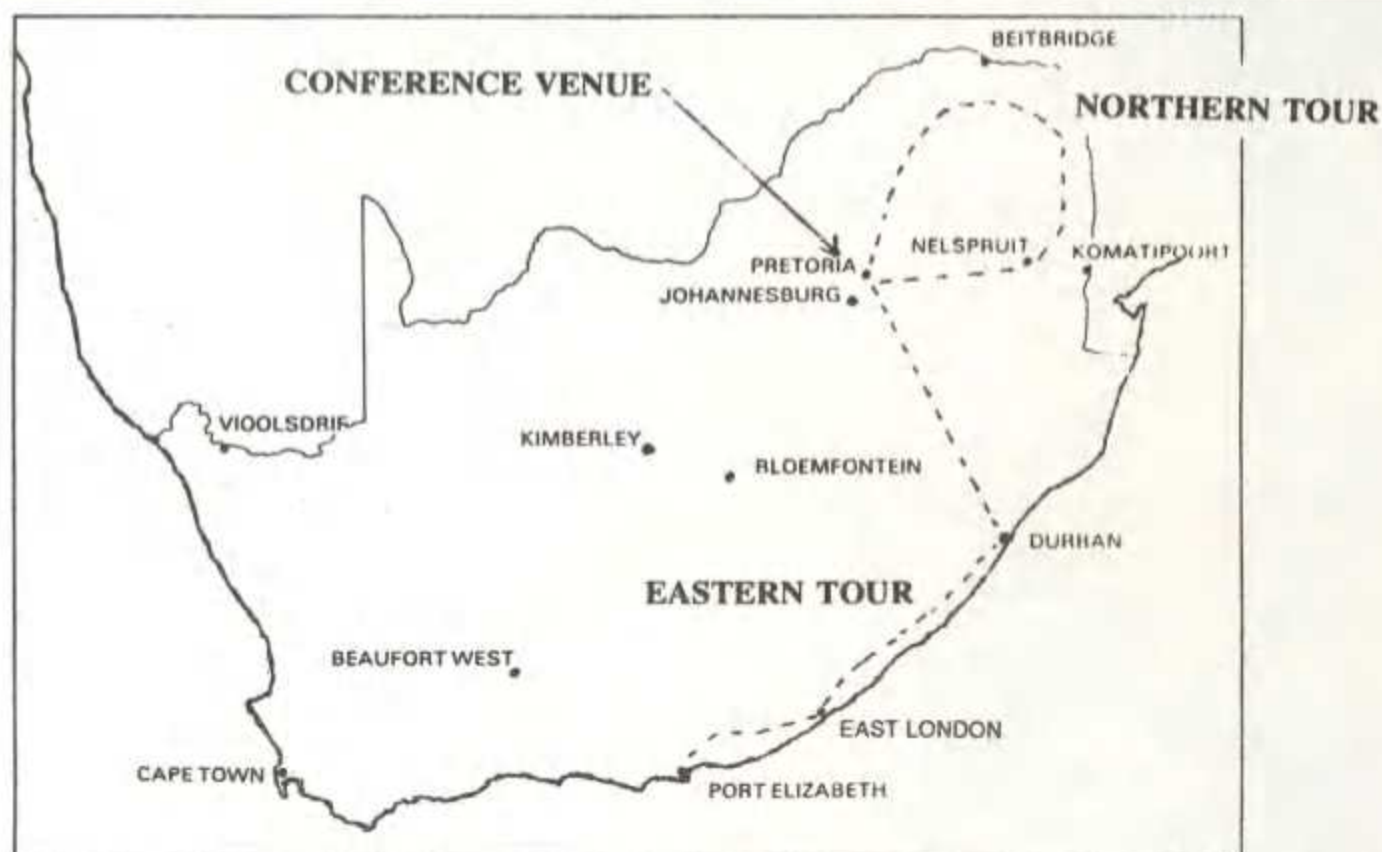
Most cycads today are confined to the tropics and sub tropics and are represented by three families on the continents of Africa, Australia, Asia and North and South America, as well as being found on islands in the Pacific, Atlantic and Indian oceans.

The families are Cycadaceae, Zamiaceae and the Stangeriaceae; the

last of which, as *Strangeria eriopus* is confined to Africa. In Australasia and the oceanic islands the Cycadaceae is represented by the genus *Cycas* and in Australia, the Zamiaceae by the genera *Macrozamia*, *Bowenia* and *Lepidozamia*, in Africa, the Zamiaceae is represented by the genus *Encephalartos* and, in the Americas, by the genera *Zamia*, *Ceratozamia*, *Microcycas*, *Dioon* and *Chigua*.

The genus *Cycas* has more than 50 species with most of these occurring in northern mostly tropical Australia and south east Asia/Oceania, whereas the genera *Macrozamia*, *Lepidozamia* and *Bowenia* are found only in Australia and in more sub-tropical latitudes.

Some species, such as *Cycas media*, *Cycas angulata* and several of the *Macrozamia* species occur in large communities, and have, since European settlement, attracted attention because of their known toxicity and fatality to domesticated animals grazing on their leaves and seeds in times of drought. ▶



Pretoria, South Africa,
July 1993

CYCAD 93 THE THIRD INTERNATIONAL CONFERENCE
ON CYCAD BIOLOGY

Cycads have also been the subject of research in other parts of the world where indigenous peoples have used parts of cycads, namely seeds, as a source of food and, in these regions a high rate of brain and nervous system complex disorders has been found to occur.

This disease, with its Parkinson's and Alzheimer's syndrome, is known as 'Guam disease' or 'Marianas dementia'. In medical terminology it is ALS/P-D (amyotrophic lateral sclerosis and Parkinsonism-dementia complex).

Although all cycads contain a range of toxic compounds, one of which is of an organic cyanide type, and can cause death after ingestion of leaves and other plant parts, the exact cause, or causal agent, of ALS/P-D has not yet been isolated or proven, although many involved with research into the problem suspect that there is a direct link between the eating of cycad seeds

and ALS/P-D neurodegenerative disease.

In Guam, the Chamorro people have had a long history of eating the seeds of *Cycas circinalis* and also have the highest incidence of ALS/P-D anywhere in the world. This has been the subject of intense research by the Mayo Clinic for nearly 30 years. So far the Clinic hasn't found a specific cause.

Ridding the seeds of toxins

In Guam the seed kernel of *Cycas circinalis* is finely sliced and these are repeatedly washed to leach out the many toxic compounds; this washing may take many days before the "chips" are ready for cooking as tortillas. A similar process is still employed by the Indians of Central America and was also used by Australian Aborigines.

Research has shown that the toxins in the seeds can be washed out and, if properly prepared, no ill

effect may result, however there remains a very high health risk in the eating of cycad seeds irrespective of how the seed slices are washed and despite the fact ALS/P-D causal compounds have not been identified.

Since ALS/P-D causing compounds have not been recognised in the seed, leaves or stems, researchers are now turning their attention to other possible cycad plant parts which may hold the key to the neurodegenerative disorders.

Dr Leonard T Kurland of the Mayo Clinic, with co-operating laboratories world wide, is investigating pollen from several different cycad genera and species in an attempt to find the elusive causal agent.


Turner points out that while cycads are known to be poisonous, their role and place in ornamental horticulture is now well-established.

The cycad *Cycas revoluta*, native to Japan and China, has been grown for centuries as garden specimens and for bonsai pot culture with no reported ill effects on humans.

In Australia, both introduced and also native species such as *Lepidozamia peroffskyana*, *Bowenia serrulata*, *Cycas* spp. and *Macrozamia* spp. are gaining much popularity in the nursery industry, and more is being learned about them through publications and discussions fostered by the Palm and Cycad Society of Australia.

While enthusiasts recognise that cycads are poisonous, it is also known that many plants such as dieffenbachia, oleander and castor oil plant are toxic and can be lethal if ingested but commonsense prevails.

All cycads require both a male and a female plant to reproduce, and from five to 20 years to reach reproductive maturity — thus it is seldom that many growers or plant buyers would ever see a seed.

"If they do," Turner says, "they should not attempt to eat the seeds or any other plant parts, should not inhale pollen and should not clean the seeds unless wearing gloves — and this same degree of caution should be applied to all other non-cycad toxic plants." 



E. GHELLINCKII

Member **George Norval** has reported that he has recently examined a number of *Encephalartos ghellinckii* specimens in the Natal Drakensburg. The accompanying photograph shows a 2-meter tall plant on the banks of the Mhlwazini River in the Champagne Castle area, at an altitude of 1920 meters, taken in February 1992. What is particularly interesting is that the previous year's flood had cut back the river bank and exposed both the soil profile and the plant's root structure.



JOHN DONALDSON Ph.D.

John Donaldson, graduate from Rhodes University and well-known to our Society for his work in cycad-insect interactions, was awarded a Ph.D. from the University of Cape Town in 1991. His thesis was titled "Adaptation to the host-plant, and the evolution of host specialization, in cycad weevils (Coleoptera : Brentidae) and received excellent reports from the three international reviewers.

The thesis dealt with one of the central problems of plant/insect interactions: what governs the range of host-plants fed upon by insect herbivores, and what factors cause insects to include new host-plants in their diets. The study concentrated on beetles feeding on cycads, which have probably been colonised by insects for at least 150 million years. The results showed that adaptation to the host-plant by the insects, for laying eggs and for finding the plants at the right time of year to facilitate larval feeding, restricted the insects to a narrow range of cycad species. The evolution of new adaptations has resulted in shifts to novel plant species, but these shifts seldom occur because a number of traits have to change simultaneously for this to happen. This study makes an important contribution to our understanding of how new insect/plant associations evolve and, therefore, also to our understanding of the evolution of new pest species on economically important plants.

Dr Donaldson is presently leader of the NBI's Conservation Biology Research Unit at Kirstenbosch, and intends continuing with cycad-orientated research work.

CYCAD CENTRE ● BROODBOOMSENTRUM

P O Box/Posbus 4726
Durban 4000
South Africa

120 Bowker Road/-weg
Escombe 4093
South Africa

Telephone: 031-442505



The Cycad Centre offers a comprehensive range of cycad-oriented goods, including *books, pamphlets, posters, greeting cards, postcards and many other items of "cycad memorabilia"*. Please write for a free catalogue.

RECENT SCIENTIFIC PUBLICATIONS

Our Overseas Correspondent for Australia, Paul Kennedy, recently published two papers in the March 1992 issue of *PRINCIPES MINOR*, the magazine of the Sydney Branch of the Palm and Cycad Societies of Australia (Editor is Peter Kristensen, 36 Coopernook Avenue, Gympie Bay, 2227 N.S.W., Australia).

In the one paper *Macrozamia diplomera* and in the other *M. stenomera* and their habitats are described and the species compared to other cycads with which they are commonly confused by the layman. The author devoted many years to a study of the cycads of N.S.W. and consequently he is eminently qualified to write these papers.

Interested members will be pleased to learn that Paul intends to publish similar articles on *M. heteromera* and the other cycads of New South Wales.

In the same issue of *PRINCIPES MINOR* a short article under the heading "A SPELLING LESSON: WHY IS IT SO?" appeared. The layman will find this paper interesting because it describes some of the rules that apply in the naming of plants. If you, at times, wondered why some plant names end in one "i" whilst others have a double "i" at the end, you will find the answer in this article.

THE CYCADS OF VERACRUZ, MEXICO was originally written in Spanish as fascicle no 26 of the *Flora de Veracruz* by A P Vovides, J D Rees and M Vazquez-Torres and subsequently translated into English by N P Moreno. Recently the English translation has been revised and also updated by the senior author to include a species of *Ceratozamia* that was described three years after the publication of the original work. The authors of the latest publication are Andrew P Vovides, Paul M Ressler and René Pérez-Lopez. Copies of this authoritative taxonomic work may be purchased for \$4.50 (U.S.) which includes postage, from:

Dr Paul M Ressler,
Virginia Wesleyan College, Wesleyan Dr,
Norfolk, VA 23502-5599, U.S.A.

WELCOME TO THE TRANSVAAL REGIONAL BRANCH

Council is pleased to announce the recent founding of the Transvaal Regional Branch of the Society which fills the need for a regional branch in the Transvaal after the Eugene Marais Regional Branch of the Society ceased to exist. The Transvaal Regional Branch will serve all members resident in the area known as the Transvaal in 1945, i.e. before parts of it became self-governing black states.

Of the three present Regional Branches, the Transvaal Branch is by far the largest with nearly 300 members. The Management Committee of the Branch consists of the following members:

Chris de Vry - Chairman
André Moolman - Vice Chairman
Koos Oosthuyzen - Regional Representative
on Council

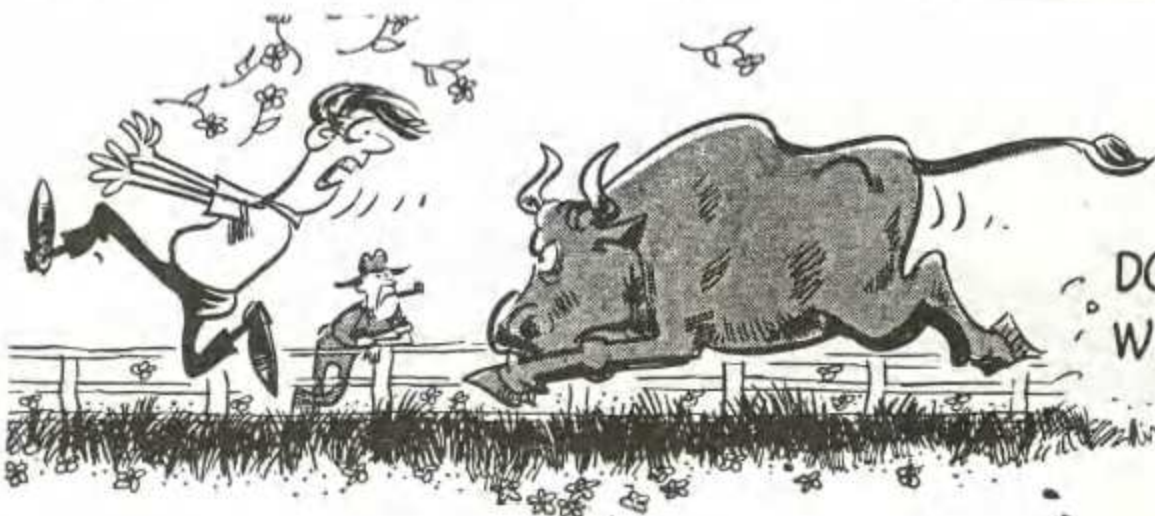
Bob Reich - Secretary
Nico Smuts - Treasurer
Kobus Naude - Seedbank & Pollen Officer
Giel Fourie - Ordinary member

Council wishes the Branch every success and hopes that it will develop into an active entity which will vigorously promote the aims and objectives of the Society in the Transvaal.

IN SEARCH OF AN HONORARY ACCOUNTANT

Through the good offices of Dr Piet Vorster, the Cycad Society of South Africa has been extremely fortunate to have his father, Mr L M D Vorster, a retired accountant and non-member, to do the books of the Society for a small honorarium for several years now and to annually draw up a statement of the Society's Income and Expenditure.

Unfortunately Mr Vorster will not be able to continue to assist us in this way after the end of this year. If any of our members can assist us by taking over from Mr Vorster Snr or can suggest another non-member that would be willing to do so, Council will be much obliged if you would contact Nat. Grobbelaar without delay at P O Box 15357, Lynn East, 0039.



DON'T PICK WILD FLOWERS ON FARM LAND
WITHOUT THE OWNER'S PERMISSION

LETTERS TO THE EDITOR

Dear Sir

The listing of the "Leading Cycad Gardens of the World" in ENCEPHALARTOS 30 is very interesting. I was unaware of some of the cycad collections and the extent of the collections of Orto Botanico in Naples and of Lowveld Botanic Gardens in South Africa. The emphasis by some gardens on their regional taxa seems a sensible approach in consideration of the space and budgetary restraints of most botanical gardens.

I hope this list does not lead to competition for high numbers of species. Botanical Gardens should be most concerned with the development of scientifically valuable collections. In addition to maturity, categories for wild collected and properly vouchered specimens should be considered for future surveys. Which of these institutions are active in cycad research or conservation efforts? Are any of the other institutions registered with CITES for the exchange of materials for scientific purposes? Are there any young botanical gardens that want assistance so they may be considered "Leading Cycad Gardens"?

Hopefully, this listing will be the first step toward greater co-operation between botanical gardens with cycad collections. It is obvious that no single garden can accomplish all that is needed to adequately conserve and understand cycads. Maybe we can do it together.

Sincerely
Charles E. Hubbuch
Curator of palms and cycads
Fairchild Tropical Garden
Miami, Florida, USA

Dear Sir,

As a private collector of palms and cycads, I am concerned about their survival. Many organizations are working to save endangered species of plants and animals from destruction and this is of utmost importance. I know that *in situ* conservation is preferable to *ex situ* conservation but unfortunately, in many areas reserves or parks cannot be created due to local conditions, therefore *ex situ* is the only alternative.

Ex situ collections of both palms and cycads in the U.S. are very limited, except for commercial production of a limited number of species. The botanical gardens that I have visited are doing a poor job of propagation of rare species, with the exception of Fairchild Tropical Garden in Florida. Private collectors generally do not propagate the species they have; there is a serious problem with dioecious species of palms and all cycads, as they must have both male and female plants. Few collectors have more than one or two of a species. I am trying to purchase rare species from other collectors so I can propagate them particularly the many species that are now unknown in the wild. Some species from mountain regions and dry hot climates will grow only in California as other areas of the U.S. are not conducive to their growth, therefore a private garden needs to be established in California. Unfortunately a private garden is necessary because of the risk factor of theft to both plants and seeds. I would appreciate any input regarding this matter.

Sincerely
Murray Laird
National Wildlife Federation
1400 16th N.W.
Washington D.C. 20036. USA

CHANGE OF ADDRESS / ADRESVERANDERING

When changing address, please notify the Secretary-treasurer, not the Printing & dispatch officer.

Wanneer u van adres verander, laat weet asb. die Sekretaris-tesourier, nie die Druk- en versendingsbeampte nie.

LETTER TO THE EDITOR

With reference to the letter from Grobbelaar, Osborne & Vorster (ENCEPHALARTOS 29:26), I believe the authors are correct - control is better than overkill by way of total prohibition.

Total prohibition will lead to all sorts of devices to avoid being detected. Prices will go up (as supply will be limited to the illegitimate trade) which may in turn lead to more unscrupulous people removing and selling seed overseas for the profits.

By allowing the release of a limited amount of seed it will allow private collectors overseas to grow the seed into mature flowering plants with a

high success rate instead of the low success rate as occurs in the wild. Plants coming in cultivation will in turn lead to further seed being available overseas taking the pressure off demand.

Clearly, I as a collector of only about 3 years, would like to add to my collection of *Encephalartos* species. However, this now seems unlikely. Anyone who has seeds/seedlings of the very rare species will now be asking the world for them.

Keith Thompson
11 Turner Street
Corinda 4075 Australia

LETTER TO THE EDITOR

I would like to exchange information with others who have experience in growing cycads from seed, especially under European conditions. I am especially interested in the optimal soil mix, and my own experience coincides closely with that reported by Helmut Schlegel (ENCEPHALARTOS 26: 22-25).

I am concerned that seedlings imported to Europe usually have a poor survival rate. Perhaps it is because of the biological clock difference when young plants are moved from the Southern hemisphere to the Northern, or perhaps it is because the forced-grown nursery plants are not robust enough to recover from the move.

Ottorino Stainer
Via Lisbona 25, Treporti 30010,
Venezia, Italia.

LETTER TO THE EDITOR

Dear Neil

I would like to congratulate you, and all others involved, on the recent improvements in the production of ENCEPHALARTOS. The format is altogether more professional and the quality of photographic reproduction is much improved. What is particularly heartening is the number of spontaneous contributions : all this augers well for the future of the magazine. I am pleased that I have been part of this progress and would like it known that many of us now regard ENCEPHALARTOS as the most valuable collection of scientific references on cycad biology available internationally.

Keep up the good work!
ROY OSBORNE

TRADE IN CYCAD SEEDS: CITES REGULATIONS

In Encephalartos 29 in a joint letter by Nat Grobbelaar, Roy Osborne and Piet Vorster, a plea was made for the relaxation of the ban on trade in Appendix 1 cycad seeds. (Encephalartos, Stangeria, Ceratozamia and Microcycas). Several points were made by the authors in support of their point of view that such a ban will not serve the conservation needs of the most endangered species.

Regrettably these arguments are specious (no pun intended) in that the point of the CITES prohibition has escaped the letter writers. CITES merely restricts the **International trade in wild collected species** hence the Acronym Convention in Trade in Endangered Species. The stance taken by the South African authorities is therefore in accordance with the International Convention to which we have been signatories since 1975. At the CITES Plants Committee meeting in Malawi, which I attended on behalf of the Cycad Specialist Group, a seminar was held on the implementation of the CITES regulations. The delegates were requested to inform their conservation authorities that the enforcement of the ban on the trade in Appendix 1 seeds merely brings the plant regulations into line with the animal, bird and reptile regulations where trade is not permitted in world collected specimens, but only in the next artificially propagated generation.

The restriction is therefore only on the International trade in wild collected seeds or plants of Appendix 1 species. This means that a decision by the country of origin to allow local collectors, nurserymen and hobbyists access to wild collected seed is not affected and in fact CITES encourages the growing of wild collected seed in the countries of origin, which they consider to be an effective means of reducing the pressure on mature plants in the wild. The authors' statement that "the restriction serves no purpose for the most endangered species ... restricting the seed trade in contrary to the philosophy of conservation through cultivation"....

therefore does not take cognisance of the fact that the ban does not in any way seek to restrict the growing of seed locally in the country of origin, it is merely an attempt to prevent the international commercialisation of wild collected seed.

Regrettably, as it is not possible to distinguish wild collected from artificially produced (i.e. garden grown) seed, the export of all Appendix 1 cycad seed is restricted by our authorities as wild collected seed would merely be re-labelled garden seed to circumvent the ban. In their letter the authors state "Cynthia Giddy has some statistics of enormous quantities of cycad seed being exported from South Africa". It should have read that application had been made for large quantities to be exported, but that the Cape Authorities had refused permission. In a report back meeting I had with the Director, Dr Neethling after my return from Malawi, he informed me that applications for quantities in excess of 100 000 had been made to him and had been refused by his dictatorship. They were as I recall, for Encephalartos friderici-quilielmi and E. lebomboensis, the latter being a re-export from KaNgwane. I have personal knowledge of an individual who has approached farmers in the Eastern Cape for cycad seed at 5c each and said "he was in the market for a quarter of a million seeds for Japanese and American buyers". Given the endangered status of our plants in the wild, we should be growing those seeds here in South Africa.

Three years ago an American offered 10 000 Dioon mejiae seeds to nurseries round the world at \$2.50 a seed (R7.00). At that price there were no takers and by the time he reduced the price, the seed was too old and dried out to germinate. Had it been sold at a reasonable price originally there would have been 10 000 Dioon mejiae growing by now. Seed is over priced by greedy middlemen and 2-3 years later when the price comes down, the seed is dried out and useless.

Had it grown in the country of origin as CITES advocates, there would have been another 10 000 Dioon mejiae in existence today. Cycads cone cyclically and Dioon mejiae might not cone again for several years which means that by removing such quantities of seed in the wild, the possible survival of that species is put at risk should some natural disaster strike that area. Many cycad species have very restricted distributions eg. our E. dolomiticus and E. cerinus.

The authors state that they gained the impression at CYCAD 90 in Australia that all cycad seeds would be delisted to Appendix 1. To do this would require a proposal to the next CITES Conference of the Parties and would have to be supported by status reports from the countries of origin of the genera involved and voted on by all signatories in the history of CITES. No species has ever been delisted, but many have been upgraded to a higher Appendix. At the Wildlife Trade Monitoring Unit's workshop which I attended at Kew Gardens in September last year, the following trade data for Appendix 11 cycad seed was presented. Annually more than 10 million Appendix 11 cycad seeds are traded internationally, in addition to the local usage in the countries of origin.

In terms of the CITES regulations, commercial trade in wild collected Appendix 11 species (plants or seeds) is permitted internationally if the country of origin has determined that the survival of that species is not threatened. It would require some very fancy footwork to convince CITES that the South African Encephalartos and Stangeria which are on Appendix 1 are not threatened by allowing unrestricted trade in wild collected seeds. The logical route for their conservation is that they should be grown locally and distributed as seedlings both locally and internationally.

At the Malawi meeting it was resolved that strict trade control of endangered African plants would be recommended to secure the economic potential of each country's natural resources.

I would like to support Messrs Grobbelaar/Osborne/Vorster that a compromise should be sought. At the Malawi meeting I tried to get a concession for garden seed in terms of numbers, eg. that small quantities for hobbyists would be exempted. However, it was felt that large quantities would simply be sent off in smaller lots of 100 or whatever maximum is decided upon, (which in fact is cheaper in terms of postal rates!). Likewise the ubiquitous practice of labelling packages "Seeds for Research Purposes" has also put the legitimate needs of researchers at Universities and Medical Institutions on hold.

During the past week I have been informed that an enormous quantity of cycad seeds has been sent to Australia without any documentation and merely labelled "For Research Purposes" with one of our South African Botanical Gardens given as the sender on the package. Nothing prevents unscrupulous persons in the cycad world from using such subterfuges to bring our Botanical Institutions into disrepute internationally.

I would suggest that we petition the conservation authorities that genuine garden seed which has been verified as such, be allowed to be exported in small non-commercial quantities to hobbyists and that such concession be strictly monitored, administered and executed by the Cycad Society who will produce the necessary guarantees as to the bona fide nature of each export. The regional seed officer will, in return for a fee, then obtain the necessary documentation and undertake the on forwarding of the prepacked package.

Cynthia Giddy
IUCN Species Survival Commission
Cycad Specialist Group.

Let's nab those cycad dealers

THE penalty for being in illegal possession of or dealing in cycads, a protected and endangered species, should be brought into line with that of the ivory and rhino horn trade.

Cycad expert, Cynthia Giddy, believes this is the only way that cycads — plants which date back to prehistoric times — will survive. They have become such a collector's item and status symbol in many South African gardens that the demand for them could lead to their extinction.

This week, Mrs Giddy praised the decision by a Pietermaritzburg magistrate who gave a Pietermaritzburg man, Dirk Scheepers, the maximum fine of R2 000 (or six months' jail) for illegal possession of 11 cycads found in his garden.

"Up to now, the fines have been very small — between R500 and R800 — and have not been much of a deterrent. Hopefully, now, people will think twice before going out and taking cycads out of the veld."

Mrs Giddy, together with her husband, Ted, a former environmental education officer at the Pietermaritzburg Botanical Gardens, have a 220 hectare farm in Umlaas Road, near Pietermaritzburg, on which they grow cycads from seedlings. They have spent 23 years championing the cause for cycads.

"I would like to see the de-commercialisation of the species and we need uniform legislation, heavier penalties and convictions, a national education campaign and the establishment of properly managed artificial breeding colonies.

The species have been protected since 1985 and it is illegal to possess a cycad without a permit. Cycads, also called "green diamond" and "growing gold", can live for between 400 and 800 years.

Mrs Giddy, the recipient of the Natal Parks Board's 1991 Conservationist of the Year Award, said the illegal trade in plants — a worldwide problem — exceeds that of the animal trade.

"Cycads are an endangered, non-renewable resource and we have to convince the public of their botanic value and not their commercial value," she said.

Mrs Giddy said she has seen nurserymen selling cycads legitimately and although she can prove that the plants have been removed from the wild, nothing is done about it.

Joanne Shepherd Smith

Cycads are found in the eastern part of South Africa from Pietersburg in the Northern Transvaal to Humansdorp on the Cape coast, Lesotho and Swaziland.

The threat to cycads in their natural environment comes from collectors' desire to own large mature plants. As only young ones are available from nurseries, many people are prepared to pay high prices for bigger specimens.

'Doing plants a favour'

Mrs Giddy, a trained anthropologist and psychologist who has moved from dealing with "odd people to odd plants", says she cannot understand the mentality of some of the illegal traders who genuinely believe they are "doing the plants a favour" by removing them from their natural habitat.

"That is absolute nonsense. Statistics show that 60 percent of cycads removed from their natural habitat do not survive. Many are damaged during removal and others don't survive in a different climate when they are moved from one province to the next.

"Farmers who say they sold the cycads found on their farms 'because I was going to plough there' are liars. Cycads grow on stream beds, cliff faces, in forests and in very rough, and inaccessible terrain."

Mrs Giddy said most private collections are taken from the wild. Cycads seed in their natural habitat and in captivity (gardens) and this fact has not been emphasised.

Mrs Giddy, a member of the International Union for the Conservation of Nature (IUCN) Species Survival Commission, has been living on her farm for 27 years. Only 12 of her more than 300 cycads — ranging from *Encephalartos natalensis* to the rarest in the world, *Encephalartos woodii* — were not grown from seed propagated in her nursery.

"Most people think cycads are slow growers which is why the majority of collectors want large mature plants. But, trees take just as long to grow and in my garden I have cycads of 25 years old which are bigger than some I have seen in the wild," she said.



Stage one of cycad growing. These seeds remain in this damp, sterile bed from six to 18 months before germinating takes place.



Cynthia Giddy artificially pollinates a cycad, a process she will repeat every 10 days for three weeks to ensure pollination occurs.

Natal's 'Cycad Lady'



Mrs Cynthia Geddy . . . relentless

was reproduced for three or four generations.

The only other plant in the world with similar longevity was the Joshua tree of the US West Coast.

"But I am pessimistic about the future of cycads, and am horrified when I go back and see what is left in areas I visited 23 years ago."

There were large amounts of money attached to cycads, and unscrupulous collectors had been hoarding them in anticipation of sanctions being lifted.

"The tragedy is that the lifting of sanctions did nothing. Cycads are still protected and cannot be exported — but the damage to natural populations has already been done."

A further problem was that collectors had removed mainly female plants — which have more attractive cones — tending to ignore male plants. This had obvious consequences for natural regeneration.

Mrs Giddy says there are still too many legal loopholes which can be exploited by collectors, and fines are "totally inadequate".

First offenders, liable to a maximum R2 000 fine, were getting away with fines of R500.

But a fine of R100 000 — comparable to rhino and elephant product penalties — was now under discussion at a senior level, she said.

Her tireless efforts to conserve cycads were recognised by the Parks Board when she was presented with the first conservation award.

Paying tribute at the award ceremony, NPB investigations officer Nico Snyman described how Mrs Giddy — who matriculated in 1951 — had "walked the legs off" officers much younger than herself while searching

CYCADS, the prehistoric plants which have survived since the age of the dinosaurs, are under threat of extinction because of unscrupulous collectors, says Mrs Cynthia "Cycad" Giddy, the respected South African authority on the rare plant species.

Mrs Giddy, of Umlaas Road, who recently became the first recipient of the Natal Parks Board conservation award, has been studying and writing about cycads for the past 23 years.

An anthropologist by training, she studied how people use plants for herbal medicine and for ceremonial occasions. Her interest was spurred after reading Rider Haggard's novel, *She*, loosely based on the Rain Queen of the Lovedu tribe in the Northern Transvaal, who had a sacred grove containing cycads.

"After visiting the site, my interest in cycads grew and I suppose I just fell in love with them.

"I think it was the antiquity that attracted me. They have hardly changed since their fossil ancestors, which co-existed with the dinosaurs.

"The dinosaurs went bang. But the cycads have survived."

She said the oldest cycads in South Africa, standing 13 metres high, are estimated to be 500 years old — although the plants' root stock could be several thousand years old.

For example, she said, the original cycad plant could have grown to a height of several metres and then been pushed over by wind. A tenacious "sucker" would then emerge from the root to form another plant. This could occur several times, so that the cycad

for cycads in remote valleys.

She had run training courses for NPB officers in the identification of cycads and was involved in at least 23 field operations. She had also assisted with a number of undercover operations to locate illegal cycad collections.

"Cynthia is relentless in her efforts to achieve a national strategy towards the conservation of cycads. She is also one of the most courageous people I have met.

"In the face of physical threats to her person, this diminutive lady has stood her ground and never faltered once. Verbal abuse has been levelled at her by various individuals, to which she responded by remaining cool and continuing with whatever she was required to do.

"Cynthia has further shown a tremendous source of energy when required to travel to distant destinations at all hours, and over weekends. She has always dropped everything at short notice and put herself at the disposal of staff."

Mrs Giddy and her husband, Ted, run a nursery in Umlaas Road specialising in cycads and indigenous bulbs.

Her book, *Cycads of South Africa*, was published in 1974 and she is presently preparing another, covering the southern hemisphere.

She also serves on the international cycad specialist group of the IUCN Species Survival Commission. In this capacity she attended the Cites plants committee meeting in Malawi last year as well as the Wildlife Trade Monitoring Unit's workshop at Kew Gardens.

Tony Carnie

Yikes! The palm tree rustlers are real dirty gang of thieves

By BRUCE V. BIGELOW
Staff Writer

Talk about a rude awakening.

A lady steps out of her place in La Jolla to get the paper at 6:30 a.m. Monday, and finds the real news is all over her front yard. There's dirt piled up on the sidewalk and 11 big holes in the real estate.

It's not the work of gophers, but of some two-legged rats who snatched 11 miniature palm trees in the middle of the night.

It turns out these were no ordinary trees. They're called Sago palms and they're worth at least \$500 apiece. The

older they are, the more they're worth.

The husband, who's a big shot at Sunburst Corp., describes them as "little, fancy, frilly jobs" about 2 feet high and 3 feet in diameter.

The victims don't want their names in the newspaper. They live between Windansea Beach and Big Rock Reef, and they don't want somebody coming back for more excavating.

"It's pretty gutsy," he says, "digging our trees up in the middle of the night."

But that's not all.



Union-Tribune /

Missing:

Stumpy sago palms are being stolen.

See Palms on Page B-7

Saturday, February 15, 1992

THE SAN DIEGO

Palms

Tree rustlers are a real dirty gang

Continued from Page B-1

Two nights earlier, a pair of Queen palms disappeared from the landscaping outside the Pet-mart headquarters in Mira Mesa. Police say the trees were 15 to 20 feet high. The total loss was \$5,000.

"When I arrived Saturday there were just holes and mud everywhere," said Russ Harris, the company president.

UNION-TRIBUNE

"There's not a week that goes by when somebody doesn't steal the fern, the potted plants, the hanging ivy," said Bill Robinson, a spokesman for the San Diego Police Department. "It's a frequent theft and it's almost a daily occurrence in our city."

Still, it's not like the cops are organizing a hot palm squad.

Detectives are busy enough with the usual glut of crimes to spend time and money trying to stalk a serial driller.

Usually, there are no witnesses. No physical evidence. No information about suspects. Which means the crime gets classified as a "mysterious disappearance."

"If we get somebody who sees something, then we would definitely assign a detective to the case," said Lt. Richard Bennett of Northeast Division.

On the other hand, who notices a tree-napping in progress?

"A landscape truck pulls up, and people don't notice that they're pulling trees up and not putting them in," said Kathy Pupilava, the plant expert for Balboa

and Presidio parks.

"Several men can lift a very large palm tree," said Charles Coburn, the chief farmer at the San Diego Zoo. "All you need are a couple of shovels."

Pupilava and other experts suspect a few shady characters in the landscaping business are behind the nocturnal plundering.

"They know exactly what they're looking for," Pupilava

said.

The only problem is that most stolen palms don't survive.

"These guys try to take a little root ball," said Phil Bergman, president of the Southern California chapter of the International Palm Society. "They have no regard for what it is."

The Sago palm is a favorite target, Bergman said, because "they're small and easy to steal,

and they're valuable."

Then Bergman gets all technical. The Sago palm is actually a cycad, *cycas revoluta*. It grows very slowly.

"It's one of the most primitive plants on Earth," he said. "It's the sort of plant that you could pass on to your grandchildren."

A Sago palm that's older than grandpa could be worth \$15,000.

NCC

B-7

JUNE 14, 1992

JUNE 7, 1992

Cycad owners unaware of law

MANY people who own cycads are unaware that they may be breaking the law. For example, we own a cycad that is 10 years old and we have no permit because it was given to us. At that time there were no rules about permits. Please help!

WORRIED
Umkomaas

Shame about the cycads

I TOO have cycads. They were on my property when I bought it. I too am worried, I cannot afford a large fine.

I suggest that, unless the Parks Board can come up with an amnesty for owners of well cared for cycads, we chop them up and make compost out of them to destroy the incriminating evidence. Seems a shame.

ALSO WORRIED
Durban

JUNE 21, 1992

Permits are not normally needed by cycad owners

IN letters in the Sunday Tribune (June 7 and 14) readers expressed concern that many people owning a cycad were unaware that they were breaking the law if they did not have a permit.

Natal Parks Board regulations covering the possession of cycads, tree ferns, orchids and indigenous bulbs state that a person may be asked to explain how such a plant came into his possession.

A "possession permit" is not required but a letter of donation or invoices from nurseries licensed to sell indigenous plants would be a satisfactory explanation. Permits are only required when such a plant is imported from or exported to another province.

The Natal Parks Board would like to emphasise that the cultivation of indigenous plants makes a valuable contribution to the conservation of the plant life of South Africa.

It is not the board's intention to embarrass well-meaning citizens but to ensure that the ruthless commercial exploitation of Natal's indigenous plants is effectively stopped.

Concerned cycad owners can contact their local Natal Parks Board zone officer, the Durban office on (031) 251 271 or the board's head office on (0331) 471 961 for further information.

J GARLAND
Natal Parks Board



NO SPECIALLY PROTECTED PLANT MAY BE IMPORTED INTO, OR EXPORTED FROM NATAL WITHOUT A PERMIT FROM THE NATAL PARKS BOARD

INDEX TO THE "FOCUS ON" SERIES

ISSUE	DATE	SPECIES	AUTHOR
Encephalartos #1	March 1985	<i>Encephalartos longifolius</i>	Maans Kemp
Encephalartos #2	June 1985	<i>Stangeria eriopus</i>	Piet Vorster
Encephalartos #3	September 1985	<i>Encephalartos caffer</i>	Maans Kemp
Encephalartos #4	December 1985	<i>Encephalartos lehmannii</i>	Maans Kemp
Encephalartos #5	March 1986	<i>Encephalartos woodii</i>	Roy Osborne
Encephalartos #6	June 1986	<i>Cycas thouarsii</i>	Piet Vorster
Encephalartos #7	September 1986	<i>Encephalartos horridus</i>	Maans Kemp
Encephalartos #8	December 1986	<i>Encephalartos latifrons</i>	Maans Kemp
Encephalartos #9	March 1987	<i>Encephalartos ferox</i>	Roy Osborne
Encephalartos #10	June 1987	<i>Encephalartos villosus</i>	Roy Osborne
Encephalartos #11	September 1987	<i>Encephalartos arenarius</i>	Maans Kemp
Encephalartos #12	December 1987	<i>Encephalartos ghellinckii</i>	Roy Osborne
Encephalartos #13	March 1988	<i>Encephalartos altensteinii</i>	Maans Kemp
Encephalartos #14	June 1988	<i>Encephalartos barteri</i>	Roy Osborne
Encephalartos #15	September 1988	<i>Encephalartos lebomboensis</i>	Roy Osborne
Encephalartos #16	December 1988	<i>Encephalartos lanatus</i>	Roy Osborne
Encephalartos #17	March 1989	<i>Encephalartos eugene-maraisii</i> (incl. <i>E. middelburgensis</i>)	Roy Osborne
Encephalartos #18	June 1989	<i>Encephalartos friderici-guilielmi</i>	Maans Kemp
Encephalartos #19	September 1989	<i>Encephalartos laevifolius</i>	Roy Osborne
Encephalartos #20	December 1989	<i>Encephalartos transvenosus</i>	Roy Osborne
Encephalartos #21	March 1990	<i>Encephalartos umbeluziensis</i>	Roy Osborne
Encephalartos #22	June 1990	<i>Encephalartos hildebrandtii</i>	Roy Osborne
Encephalartos #23	September 1990	<i>Encephalartos ngoyanus</i>	Cynthia Giddy
Encephalartos #24	December 1990	<i>Encephalartos princeps</i>	Maans Kemp
Encephalartos #25	March 1991	<i>Encephalartos gratus</i>	Roy Osborne
Encephalartos #26	June 1991	<i>Encephalartos cycadifolius</i>	Maans Kemp
Encephalartos #27	September 1991	<i>Encephalartos paucidentatus</i>	Roy Osborne
Encephalartos #28	December 1991	<i>Encephalartos aemulans</i>	Piet Vorster
Encephalartos #29	March 1992	<i>Encephalartos dyerianus</i>	Piet Vorster
Encephalartos #30	June 1992	<i>Encephalartos dolomiticus</i>	Piet Vorster
Encephalartos #31	September 1992	<i>Encephalartos inopinus</i>	Roy Osborne

POLLINATION: WET OR DRY?

The necessity for artificial pollination of cycads in public and private collections has been amply covered in various articles in ENCEPHALARTOS. However, not much discussion has been made on the relative merits of wet (pollen stirred up as a slurry in water) or dry (pollen blown in or poured into the cone, neat or mixed with an inert medium like sand) pollination techniques. All methods have their supporters, but little quantitative information is available on which to make a decision.

Recent observations are that pollination of a number of valuable cones of species like *E. inopinus*, *E. laevifolius* and the grey-leaved cycads has been unsuccessful when "wet" pollination techniques are used. The cone scales typically go brown, the cone axis rots and the seeds have a jelly-like consistency. For these species it may be that "dry" pollination would be more appropriate.

If you are able to offer any useful comments from your experiences, please write to the editor.