

# ENCEPHALARTOS

JOURNAL OF THE  
CYCAD SOCIETY OF  
SOUTHERN AFRICA

NO. 21

TYDSKRIF VAN DIE  
BROODBOOMVERENIGING  
VAN SUIDELIKE AFRIKA

MARCH/MAART 1990



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## VOORBLAD/COVER

### ENCEPHALARTOS UMBELUZIENSIS

A female cone at the seed-shedding stage, as photographed in habitat in the Mlawula Reserve in Swaziland. Note the presence of several seedlings from a previous season's coning near the base of the cone stalk.

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## FROM THE PRESIDENT

With this issue of Encephalartos the journal has come of age - at least as far as numbers rather than years are concerned.

The Journal probably is the single most important contribution which the Society makes to its members. It therefore is appropriate at this time to pay tribute to Maans Kemp who edited the Journal on a honorary basis with devotion up to number 16. We are grateful for the diligence of the new Editors and hope they will be able to carry the burden for many years to come.

To many of us it is sad that Roy Osborne did not make himself available for the Presidency for another term. It would be difficult to find his equivalent for the Society in terms of enthusiasm, productivity and drive.

The names and addresses of Office Bearers for 1990 - 1991 appear elsewhere in this issue of the Journal. The stalwarts are thanked for their willingness to continue managing the affairs of the Society. The few new members are most cordially welcomed with the hope that they will participate actively.

Now that I have taken over the reins from Roy at the beginning of 1990, I trust that you will continue to support the Journal with contributions and suggestions.

Nat Grobbelaar

## VAN DIE PRESIDENT

Met hierdie nommer van Encephalartos het die tydskrif sy mondigheid in terme van nommers eerder as jare bereik.

Die tydskrif is waarskynlik die grootste enkele bydrae wat die Vereniging aan sy lede bied. Dit is dus paslik om by die geleentheid hulde te bring aan Maans Kemp wat tot en met nommer 16 die Tydskrif met soveel toeweyding en sukses gratis versorg het. Ons is dankbaar vir die ywer van ons nuwe redakteurs en vertrou dat hulle nog vir jare die veeleisende taak sal behartig.

Vir baie van ons is dit 'n groot jammerte dat Roy Osborne hom nie vir 'n verdere termyn as President beskikbaar wou stel nie. 'n Mens sal ver moet soek om sy gelyke te vind in soverre dit entoesiasme, produktiwiteit en dryfkrag vir die sake van die Vereniging betref.

Die name en adresse van die Ampsdraers vir die 1990-1991 termyn verskyn elders in hierdie uitgawe. Hartlike dank word aan die staatmakers betuig dat hulle bereid is om voort te gaan met die behartiging van die sake van die Vereniging. Die enkele nuwe lede word met groot verwagting vir 'n aktiewe termyn verwelkom.

Waar ek sedert die begin van 1990 die leisels by Roy oorgeneem het, vertrou ek dat u steeds die Tydskrif aktief met bydraes en wenke sal onderskraag.

Nat Grobbelaar

# FOCUS ON...

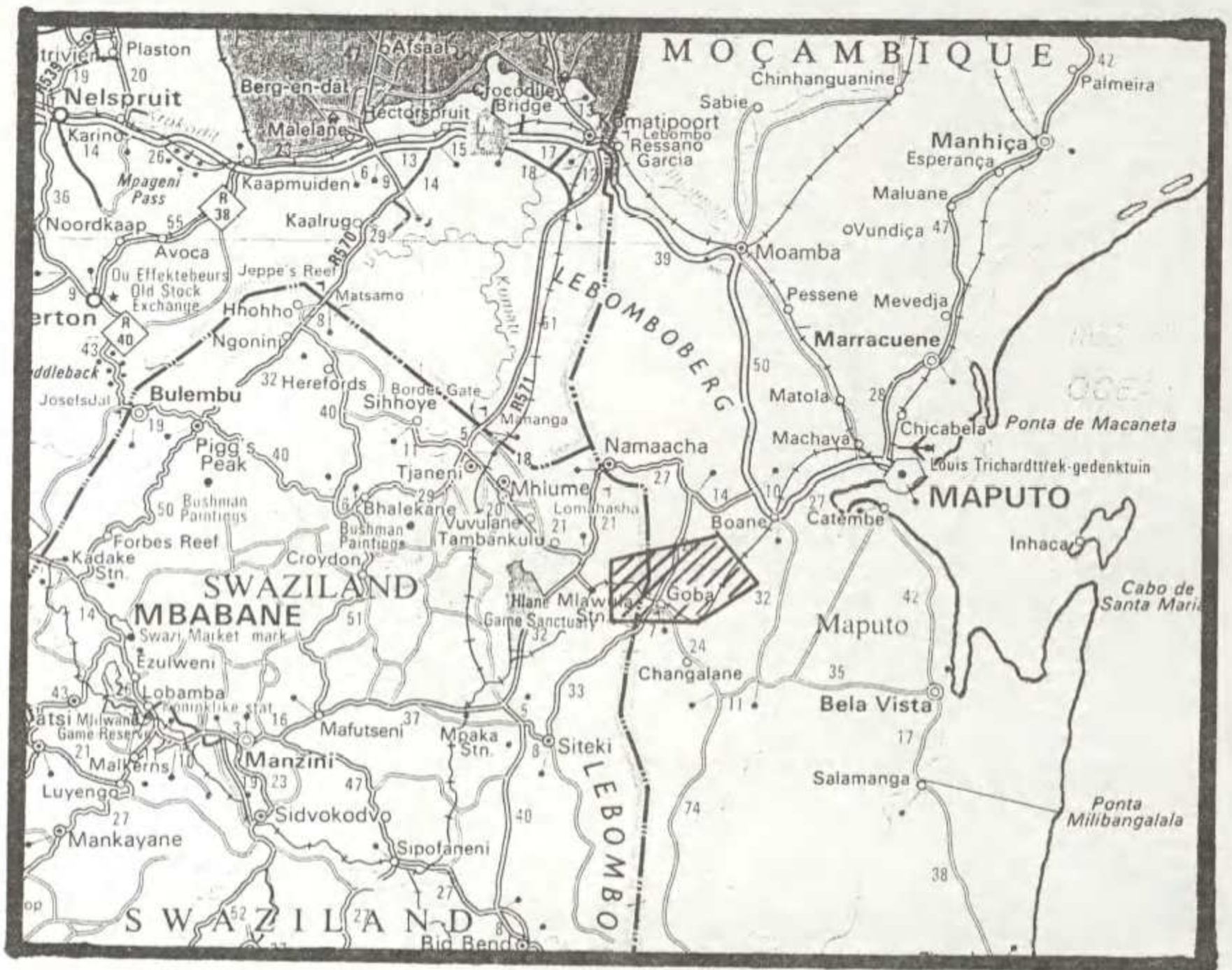
# FOKUS OP...

In each edition of ENCEPHALARTOS, we focus on one Southern 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 broodboomspe in die vorm van 'n in-diepte-artikel in leketaal. In hierdie uitgawe val die kollig op:

## ENCEPHALARTOS UMBELUZIENSIS

by Roy Osborne



Map showing approximate general locality of *Encephalartos umbeluziensis* (shaded area centred around Goba) in the Mbeluzi River catchment area on the Swaziland-Mocambique border.

## INTRODUCTION

Although the Kingdom of Swaziland extends only about 130 x 170 km, it hosts 6 or possibly 7 species of *Encephalartos* [*E. heenanii*, *E. laevifolius*, *E. lebomboensis*, *E. paucidentatus*, *E. umbeluziensis*, *E. villosus* and possibly *E. ngoyanus*]. None of these is confined to Swaziland alone, and our plant of interest in this text - *E. umbeluziensis* - is shared by Swaziland and Mocambique. A recent field trip (September 1989) by the author has revealed some new data on this species.

## DISCOVERY

Credit for the discovery of *E. umbeluziensis* must perhaps go to unnamed tribesmen of southern Mocambique who transplanted occasional specimens to their kraals and to the homes of European settlers. An examination of herbarium records from 1920 to 1950 shows that specimens of a "new" cycad species were found growing in Mocambique gardens at Inhambane, (Dr Marloth, 1924), Ressano Garcia, (Prof. C E Moss, 1944; Mary Gunn, 1945) and Namaacha (Albert Mogg 1944 and 1947) and in Southern African gardens at Komatipoort (Professor C E Moss, 1964) and Barberton (George Thorncroft, 1947). This apparently "different" cycad intrigued Mr Brandsby A Key, a Johannesburg chartered accountant, well-known in wildlife circles and a keen aloe and cycad enthusiast, who set off to find the source of these plants. He located them in 1945 on the banks of the Mbeluzi River about 30 km from Maputo and collected leaf, cone and plant specimens which he showed to Drs Dyer and Verdoorn in Pretoria. They recognized the importance of his discovery and proceeded to explore the area in detail, collecting herbarium specimens in 1947 and 1948 from several sites along the Mbeluzi in both Mocambique and Swaziland. The main concentration was located near Goba on the border of these two countries. They also found plants of the same species growing in gardens at Siteki in Swaziland. During this period the plant had been given a variety of names: Lewis in *Flora Zambesiaca* referred to it simply as "*E. villosus*", Paiva called it "*E. villosus* var. *umbeluziensis*" and M R



Typical appearance of *E. umbeluziensis* in dense thornveld near the confluence of the Mlawula and Mbeluzi Rivers in Swaziland.



The type specimen of *E. umbeluziensis* as collected in Mocambique in September 1945 by B.A. Key. This specimen, a duplicate of the holotype, is on file (No. 28429) in the Natal Herbarium.

Henderson in 1945 referred to it by the clumsy title "Encephalartos sp. aff. *E. caffer* vel. aff. *E. villosus*". The matter came to rest in 1951 when Dr Dyer published the official description in Volume 28 of *The Flowering Plants of Africa* and named it as *Encephalartos umbeluziensis*.

The epithet of course refers to its occurrence in the Mbeluzi catchment area. The name of the river, in turn, seems to be derived from the African word *beluza* or *bekuza*, which in Afrikaans translates to "bokspringend" or in English "the energetic fizzy one", with allusion to the character of flow of water in the river (pers. comm. Professor T.J.R. Botha).

### DISTRIBUTION

*E. umbeluziensis* is fairly abundant but in a restricted locality which extends from the lower flood plains of Mbeluzi in Mocambique back in an western direction to the Swaziland lowveld. The maximum altitude seems to be that of the population in the Mlawula River, a tributary of the Mbeluzi, at 120 meters. The habitat is generally thornveld scrub with a summer rainfall averaging about 500 mm p.a. The area is frost-free and often very hot and humid. Plants are most often found on the flatish shoulders along the various streams which flow into the Mbeluzi.

The species is comparatively rare and not widely represented in private or public gardens. However, plants are present at the Orto Botanico (Naples), the Paris Museum of Natural History, the Les Cedres gardens (St.-Jean-Cap-Ferrat) and at Kew in Europe; at the Fairchild and Huntington gardens in the USA; and at Ewanrigg, Kirstenbosch, Nelspruit, Pretoria (B.R.I. and University of Pretoria) gardens in southern Africa.

### DESCRIPTION

#### 1. Stem

The stem of *E. umbeluziensis* comprises a subterranean spherical caudex about 25 cm in diameter. Occasionally when plants are growing in rocky situations the caudex is forced to develop above ground level and can then form a trunk 30 cm tall. The stems never branch unless physically injured.

#### 2. Leaves and leaflets

Each plant bears only 5-8 stiff, straight leaves, each about 1-1,5 m long, including a characteristic bare petiole 20-25 cm long which is circular in cross section.



The author inspecting *E. umbeluziensis* in habitat near the Mbeluzi River. Photo by George Norval.



*E. umbeluziensis* as a container plant at the Lowveld Botanic Gardens, Nelspruit.

The dark green leaflets are borne in pairs about 1 cm apart so that leaflet surfaces do not overlap. They are inserted into the leaf rachis at a slight twist to give what Dr Dyer describes as a "half-opened venetian blind" effect. Median leaflets typically measure 10-20 cm by about 8-15 mm and usually bear 3-4 teeth on the lower margin and 0-1 on the upper. Leaflets are somewhat reduced in size towards the apex and base but not to the series of prickles as in *E. villosus*.

### 3. Cones

*E. umbeluziensis* plants bear 1 or 2 male cones in habitat, but vigorous garden specimens can produce up to 4 cones. The cones are about 30 cm long by 6-10 cm in diameter and are supported on peduncles 10-12 cm long by 2.5-3 cm in diameter. The scale faces give the cone an olive green colour which becomes progressively more yellow as the cone reaches maturity, taking on a pink or orange tint after the pollen has been shed.

Female plants invariably produce a solitary cone typically 25 cm long by 12-15 cm in diameter, supported on a stout 10-15 cm long peduncle 3.5 cm in diameter. The cones are initially olive green but take on an apricot or yellow colouration at maturity. The cone scales are smooth and rounded with well-defined lateral ridges running to a blunt terminal facet.

Seeds are shed in September and are a glossy deep red colour and measure typically 3.2 cm by 2.3 cm. The seed kernels are fairly prominently ribbed with a reticulate pattern visible between the ribs, a character which is also noticed in *E. villosus* and *E. cerinus*. Seeds are about 2.7 cm long by 1.8 cm wide and displace a volume of 4.3 mls.

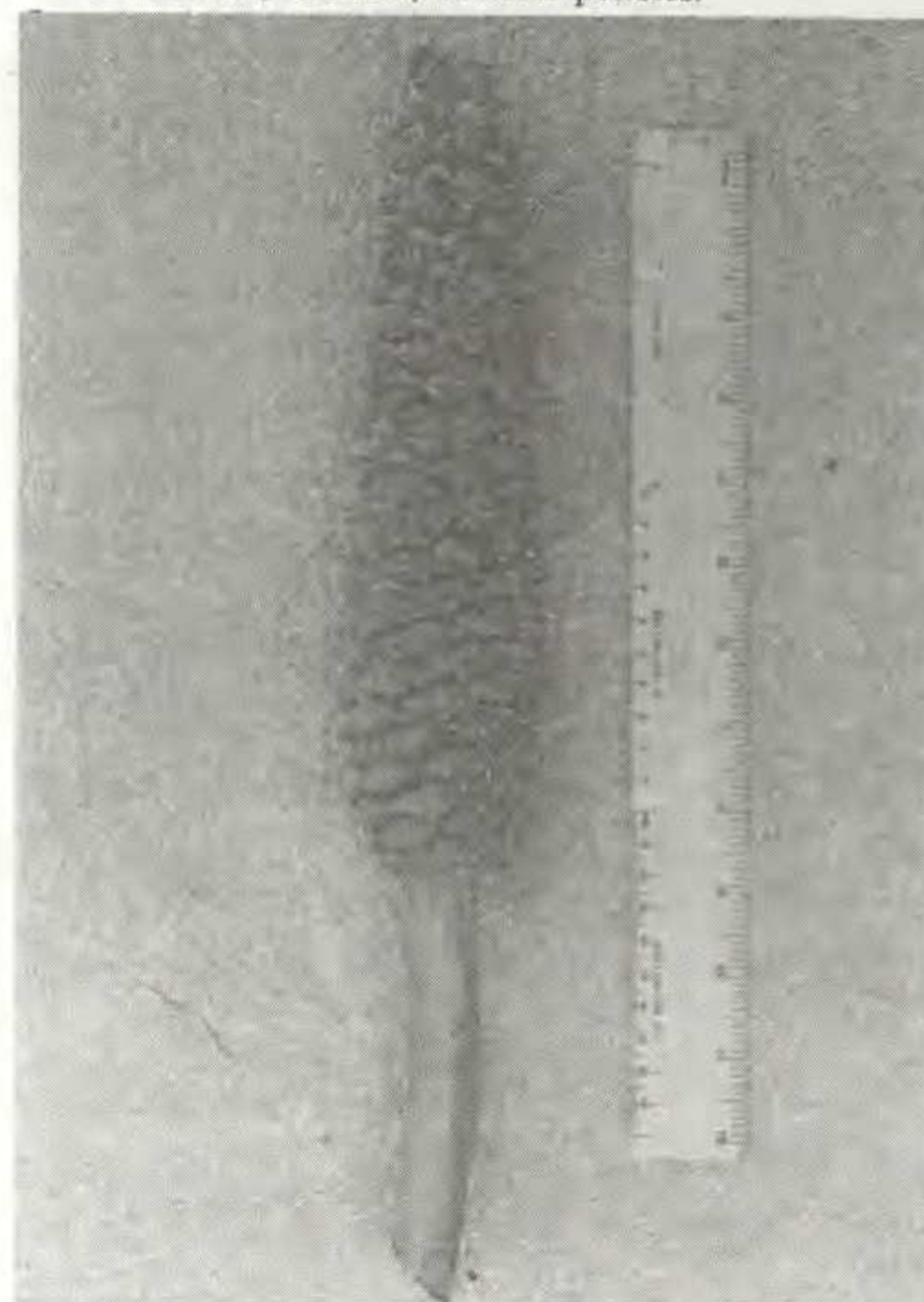
### CONSERVATION AND CULTIVATION

The difficult terrain and the considerable distances involved originally resulted in this species being less prone to exploitation than others. However, construction of and maintenance work on the Mbabane-Maputo rail link has altered the situation and on a field trip by the author in September 1989 it was apparent that a large number of mature plants had been removed from habitat - even within the borders of the Mlawula Reserve. Sheryl Gilbert listed the species as "vulnerable but probably not threatened" in 1984 but this classification may need revision.

The plant is said to grow well in cultivation although it may suffer from leaf-scorch in full-sun situations. It is not frost-hardy. It is hoped that those with specimens



Female cone of *E. umbeluziensis* in habitat. The cone scales give an apricot-yellow appearance to the cone. Note also the stout peduncle and the smooth, rounded, bare leaf petioles.



An excised male cone of *E. umbeluziensis*.  
Photo : Nat Grobbelaar.

of this species in public and private gardens will make all efforts to pollinate and harvest seed from their plants and thus make seedlings more readily available to the collector.

A curious incident of a sex-change in *E. umbeluziensis* was reported by Van Wyk and Claassen in 1981, this being the first of several documented gender reversals in *Encephalartos*. Briefly, the report outlines a plant of *E. umbeluziensis* in the Pretoria garden of Dr M I Claassen which bore a male cone in 1970 but a female in 1979. Speculation was made that the freak 1972 cold spell in Pretoria might have been the stimulus for the change, [see ENCEPHALARTOS 2:20-22, 2:24, 8:34-35, 13:42 and 19:27 for further details on this topic]. Dr Claassen has informed me that the same plant coned again in 1983 and 1989 and has retained its acquired female status - indeed, some of the 1983 seed gave rise to normal seedlings.

### AFFINITIES AND HYBRIDS

Previous reports have indicated that *E. umbeluziensis* is most closely related to *E. villosus*. These two species are quite easily distinguished on the leaf morphology. The 20-25 cm bare petiole of *E. umbeluziensis* is quite different to the situation in *E. villosus* with the progressive reduction in leaflet size to a series of prickles at the leaf base. Features based on cone colour and morphology can be misleading in the separation of the two species.

However, recent work on a computer-based statistical analysis of nearly 80 different characters for each species has revealed that *E. caffer*, *E. ngoyanus*, *E. cerinus*, *E. umbeluziensis* and *E. poggei* may constitute a closely-knit group and that *E. villosus* is more distantly related than previously supposed. The five species do indeed share many characters but careful examination of leaves and cones does allow them to be distinguished one from another. Since they occur in widely-separated habitats, there is little chance of confusion if the plant can be traced back to a definite locality.

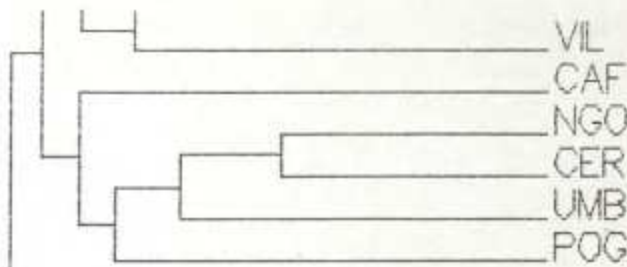
Cynthia Giddy records artificial hybrids between *E. umbeluziensis* (male) and *E. villosus* (female) and vice-versa; these plants showing characters intermediate between their parents. Piet Vorster (see ENCEPHALARTOS 10:10-15) similarly reports hybrids between *E. umbeluziensis* (female) and *E. villosus* (male) and also between *E. umbeluziensis* and *E. lehmannii*, both sets likewise showing intermediate characters.



Female cone scale and seed details of *E. umbeluziensis*. Photo : Nat Grobbelaar.



*E. umbeluziensis* seed kernels showing the reticulate pattern between the longitudinal ribs - a character which it shares with *E. cerinus* and *E. villosus*.



Part of the output from a computer-based cluster analysis for *Encephalartos* as presently being investigated by Osborne, Grobbelaar and Vincent. The grouping shows the hierarchical relationships between *E. caffer*, *E. ngoyanus*, *E. cerinus*, *E. umbeluziensis* and *E. poggei* with *E. villosus* only distantly connected.

#### ACKNOWLEDGEMENTS

I would like to express my appreciation to Dr Johan Geysler, who first showed me *E. umbeluziensis* in habitat, and to his wife and family for their kind hospitality in Swaziland. I thank Professor Nat Grobbelaar for his comments on the first draft of this text. Photographs are by the author unless stated otherwise.

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## CYCAD CONSERVATION PROPOSALS

A paper entitled *Towards a Conservation Strategy for the South African Cycads*, by Roy Osborne, has been published in *The Naturalist* [Vol 33, Part 3, November 1989, pp. 21-27]. The article outlines the present status and difficulties with cycad conservation legislation and proposes a seven-point action plan for future cycad conservation measures.

## SEED WANTED TO BUY

Ivan Baxter of 59 Royal Parade, Alderley, Brisbane, Queensland 4051, Australia, [telephone 07-352-6460] wants to purchase commercial quantities of seed of the following species of *Encephalartos*:

*E. manikensis*, *E. ferox*, *E. villosus*, *E. transvenosus* and *E. natalensis*.

He also has available some Australian cycad seed which is regarded as hard-to-get.

# POLLEN EXCHANGE

POLLEN EXCHANGE OFFICER

Cynthia Giddy, P.O. Box 45, PO  
Umlaas Road, 3730 - Tel: 03325-478

44 members have sent in details of their male cones since the pollen bank started in 1985 and the total number of plants listed numbers 593. These comprise 28 South African *Encephalartos* species as well as *Stangeria*. Foreign species listed are 3 species only, totalling 10 plants. The 44 participants are as follows:

4 Botanical Gardens - 188 plants (Nelspruit, Pretoria University, Kirstenbosch, Skukusa)

40 individual members consisting of:

15 members with 1-3 plants 37.5%, 15 members with 3-10 plants 37.5%, 7 members with 10-20 plants 17.5%, 3 members with 20-50 plants 7.5%

75% of the returns are thus from those members with less than 10 plants. It should also be mentioned that I have received 6 returns from overseas members which are not included in the above statistics but are on record should we receive a request for pollen from that country.

## Species analysis:

Most common: *E. altensteinii* (60) *E. villosus* (57), *E. horridus*, (50) *E. trispinosus* (45) *E. natalensis* (40)

Rarest: *E. woodii* (1), *E. heanenii* (2), *E. cupidus* (3), *E. cycadifolius* (4), *E. laevifolius* (4) *E. ghellinckii* (4).

We therefore would like to see more members with larger collections offer pollen. Likewise the data sheet merely reflects ownership of the male plants of the species indicated, that plant may not necessarily cone each year. We therefore need back up numbers. I would like to put on record that although the Durban Botanic Gardens have not sent a data sheet they are most co-operative and generous to members and non members alike.

11 members have sent in 2 or more updates. Regular updates are important as members collections mature or increase and other details such as telephone numbers could require updating. I have suggested that the membership secretary includes a pollen questionnaire when a new member joins and that the first issue of the year carries a pollen questionnaire with the request that members update their information.

At present I have frozen pollen of the following 18 species available:

*E. altensteinii*, *E. arenarius*, *E. eugene-maraisii*, *E. ferox*, *E. horridus*, *E. inopinus*, *E. lehmanii*, *E. lebomboensis*, *E. longifolius*, *E. "msinga"*, *E. natalensis*, *E. ngoyanus*, *E. transvenosus*, *E. trispinosus*, *E. villosus*, *E. woodii* as well as *Dioon edule* and *Ceratozamia mexicana*.

Pollen requests: I received 32 requests this season. I was able to assist some but in many cases there was no one with pollen available in the same area as the person enquiring. I sent out 6 lots by mail and 9 collected pollen from me those in the areas I put in touch with members who have male plants of the species requested.

The pollen bank provides a valuable service in that plants in cultivation can still be productive and produce fertile seed to assist in the conservation of an endangered plant group. By ensuring that every seed produced in cultivation is fertile, we can, by cultivating and distributing seedlings decrease the pressure on the wild populations.

Please fill in and return the pollen questionnaire which is included in this issue as soon as you have determined the sex of your mature plants. I would also like to ask those who have previously sent in details to update this information as well as telephone numbers and address changes.

# CYCADS IN CHINA BY IAN TURNER

I.S. TURNER  
SPRINGS FARM  
P.O. BOX 2162  
HARARE  
ZIMBABWE



*Cycas micholitzii* is the odd man out in the *Cycas* family because of its beautiful multiple branching leaves. It grows in an area in South West China near the border with Vietnam and most likely in Vietnam and Laos also. I went to China in the hope of being able to see this plant growing in the wild and maybe collect a couple of specimens but since the area where it grows is restricted because of military activity, I was unable to go there.

However, I arrived in Kunming in the Yunnan province of China in January 1989 and since it was winter found it very cold indeed. I had a contact at the Botanic Gardens in Kunming so the following day went to look for him but found he had left for Beijing. Some of the very helpful staff there showed me their *Cycas* collection which included two plants of *Cycas micholitzii*. One was growing in a pot in the open and the other was in a pot in a greenhouse. The one outside was obviously suffering (like me) because of the cold weather; its leaves had not grown out to their full extent. Where these plants grow near Vietnam the weather is much warmer.

The plant in the greenhouse looked quite different to the one outside, so much so in fact that some of the people there thought it was a different species. The Kunming Botanic Gardens which is in fact the Kunming Institute of Botany is quite extensive and there are some very nice greenhouses with a varied collection of plants, Cacti, Orchids, Bromeliads, Ferns etc. are all to be found there and outside there are some beautiful Camellias to mention only one of the many shrubs and trees to be seen.

Another *Cycas* which I was interested to see is *Cycas panzhihuaensis*. These plants grow near a town as the name of the *Cycas* suggests Panzhihau formerly known as Dukou. Panzhihau is a small mining town in the south of Sichaun province. I have been in contact with the director of the Botanic Gardens in Panzhihau, Comrade Zhou, and he kindly came with an interpreter, Comrade Wang, to meet me in Kunming.

The following day we travelled from Kunming to Panzhihau by road which is about an eight hour drive. The whole countryside in that area is very mountainous so the road twists and turns through the mountains and it was never possible to go very fast. The roads are quiet with no private cars on the roads because no one owns a car. Since it was winter when no rain falls, the whole area was very dry indeed, but in most of the valleys there was some irrigation and lots of vegetables and Broad beans were being grown. The Chinese certainly work very hard in their fields and the cabbages etc. they were growing were about the best I have ever seen.

My first sight of *Cycas panzhihuaensis* was at the hotel in the town of Panzhihau where I stayed my first night.

There were some very nice specimens growing in the garden there. I only stayed in the hotel one night because Comrade Zhou very kindly let me stay in the good accommodation he has in his Botanic Garden. There of course are very many fine specimens of *Cycas panzhihuaensis*. This is a very beautiful Cycad similar in some respects to *Cycas taiwaniana* but instead of the dark green leaves of *Cycas taiwaniana* this species has leaves with a bluish grey sheen to them.

The following day we went into the mountains to where *Cycas panzhihuaensis* grows wild. We followed the road taken by the mine vehicles. The mine is in fact taking away whole sides of the mountains and the excavation work there is really on a grand scale. Seemingly quite a few cycads were lost when part of a hillside was taken. We left our car and carried on by foot past the mining operations and came to a place which has been declared a reserve for the cycads. There are very many of these beautiful plants growing there some up to 8ft tall, one plant looked as if it was growing out of a rock. A seed must have fallen into a crevice many years ago and found a crack to send its roots down to the soil now the plant which is about 5 ft tall had filled the crevice and is just sitting on top of the bare rock enjoying the sunshine in the cool mountain air.

Every year people from the Botanic garden collect all the seeds produced by the plants and grow them in the gardens so there are now very many plants in the nursery area of the gardens. This is a very good way to preserve a species. It can be said that there is no natural regeneration but if the seeds were left in the wild only a very small percentage would grow into mature plants. Now, in cultivation, virtually all the seeds which germinate will grow. If at some time it is felt that the wild population is dwindling it can be boosted by the cultivated plants. As I see it, with all the destruction of habitats these days for farming, road building, towns etc. the only way a species is going to be preserved is by cultivating it.

The Panzhihau Botanic Garden have one specimen of *Cycas micholitzii* but it is too cold in that area for it to grow to its full extent. They also have specimens of *Cycas pectinata* and what looked to me like *Cycas sichuanensis*. I had taken some *Encephalartos* species with me so was able to do a very worthwhile exchange.

Comrade Zhou told me about some other Cycads growing at the steel works office which are thought to be *Cycas hainanensis*. There are two plants with very long leaves growing in big pots and each had a sucker. I was very grateful to the mine director for allowing me to have the suckers. There were some other Cycads growing around the office and beds of flowering plants and many kinds of pot plants decorated the area together with water fountains; it all looked very nice indeed.

Still with *Cycas micholitzii* in mind we decided to go to a place called Xishangbanna which is in the far south of Yunnan. There is a tropical Botanic garden there and I thought I would have a better chance of finding some of these plants because it is not too far from their habitat.

Comrade Zhou was unable to accompany us but he sent his assistant, Comrade Yung who is quite knowledgeable about Cycas and is in fact the co-author with Comrade Zhou of *Cycas panzhihuaensis*, so we set off with Comrade Wang.

It was a two and a half day journey to get to Xishangbanna by car. Still the roads passed over many mountain chains and at times we were driving on roads high above the valleys which were filled with clouds. The scenery was very beautiful.

The Botanic gardens in Xishangbanna is not only a Botanic garden but a research centre also. Many kinds of fruit trees are being grown and experiments are carried out with other plants of agricultural value and an area has been set aside for the planting of endangered species so the whole area covers many acres. One area in the garden was being landscaped and a lot of *Cycas pectinata* plants were being transplanted from the nearby forest to make quite a spectacular exhibit. One plant in particular stood out; it must have been at least fifteen feet high and had many long branches, how it was transplanted to its new site remains a mystery. It certainly must have taken a lot of manpower!

The gardens have also a nice collection of Palms and some good specimens of *Roystonea*, *Arecastrum*, *Neodypsis*, *Pheonix Arecnga* to name just a few, which were all growing well.

Unfortunately no *Cycas micholitzii* were to be found but I was able to exchange a couple of the *Encephalartos* I had with me for some plants of a *Cycas* which looked different to the *Cycas pectinata* which grows in that area. They could be *Cycas yunnanensis*. *Cycas micholitzii* seems to be quite rare in cultivation and I was told that it is hard to find its habitat. It is a pity that a Botanic garden does not get some plants together so that seeds can be produced.

Here in Zimbabwe I am fortunate to have male and female *Cycas micholitzii* var. *simplicipina* and have produced a good number of seedlings. So we get back to the conservation by propagation in cultivation again.

The Xishangbanna garden are about 40 miles from the town of Xishangbanna so after staying one night in the very good accommodation at the gardens we carried on to see the town which also has a small garden of its own.

Xishangbanna is a town where most of the tourists from the West like to go. There is a very good hotel complex there with lots of small double story buildings where one can rent rooms. It is all set in a landscaped area with big trees, palms and flowering plants. They have bicycles for hire so it is not unusual to see the tourists pedalling their way around town.

The people who live in that South West part of China are quite different from those from further North, they are more like the people from Thailand and Burma. There are some restaurants where one can get the delicious traditional food cooked in that area and although I must admit sometimes it is hard to tell what one is eating, it all tasted very good indeed.

We left Xishangbanna and headed back to Kunming. Although it is quite a long drive there are always things of interest to see on the way.

In Kunming I was sorry to say goodbye to Comrade Wang and Comrade Yung, they had been good travelling companions and always did their best to make the trip go well.

I had to wait three days in Kunming until I was due to fly out to Hong Kong so I went back to the gardens there to see if my friend had returned from Beijing and was lucky to find that he had but at that time he was in town at a meeting.

The following morning he came to see me at my hotel and we had a long talk about the Cycas at the gardens, not forgetting the small *Cycas micholitzii* I had seen there. I told him that I had some species of *Encephalartos* for exchange so he said he would go and talk it over with some of the heads of the departments and he would phone me. I was very pleased to get a phone call to say come tomorrow morning because they were interested in an exchange.

I arrived bright and early at the garden and just about froze while waiting at a gate to be let into the greenhouse area. I showed them the plants I had with me and they brought along some interesting looking Cycas species but it did not include a *Cycas micholitzii*. I explained to them that I had come from very far away Africa and the main object of my trip was to get a plant of that species and it would indeed be hard for me to have to return without one. After a long discussion between themselves and more green tea, I was very pleased to hear that although *Cycas micholitzii* is a very rare plant since they have two in the garden, they would let me have the small one from the greenhouse. So with that plant and another which looked like *Cycas sichuanensis* and a couple more *Cycas pectinata* I returned to my hotel.

I had heard about a street market in Kunming where plants are sold so I decided to go and was happy to find a man selling some small Cycas plants which looked like *Cycas yunnanensis*. I must admit that I had not heard about *Cycas yunnanensis* before I went to China but now, having seen these plants, they do look different to any other Cycas I know. Also on the market were some beautiful orchids and parakeets and some very nice monkeys and lots of very colourful gold fish. So it was quite an interesting place to spend time seeing the items they had for sale.

I got all my plants packed up and left the following morning aboard the very good airline China Aviation for Hong Kong.

It was five weeks before the plants were unpacked and I was pleased to find most of them had new roots and some even leaves growing inside the parcel. They continued to grow well and now three months later I have some of them planted out in the garden. The others are all growing well in pots. It seems important with small Cycas plants to not let them dry out, each plant had the old leaves cut off and was thoroughly washed then wrapped in newspaper and sealed in a plastic bag.

There is enough moisture on the plant to keep the newspaper slightly damp inside the bag and new growth will start. If the plants are packed completely dry it takes a long time for new roots to form and in the meantime the plant is drying out even more and usually deteriorates to such an extent that new growth is impossible.

In the good climate of Zimbabwe these plants will grow fast and I am looking forward to seeing seeds on some of them in the not too distant future.

I had a very pleasant stay in China and found the people very helpful. I would like to go back again one day to try to locate *Cycas micholitzii* growing wild.



*Cycas micholitzii* juvenile leaf. When mature, leaves branch much more.



*Cycas panzhihuaensis* growing out of a crack in a rock.



*Cycas pectinata* recently transplanted to Xishangbanna Botanic Garden.

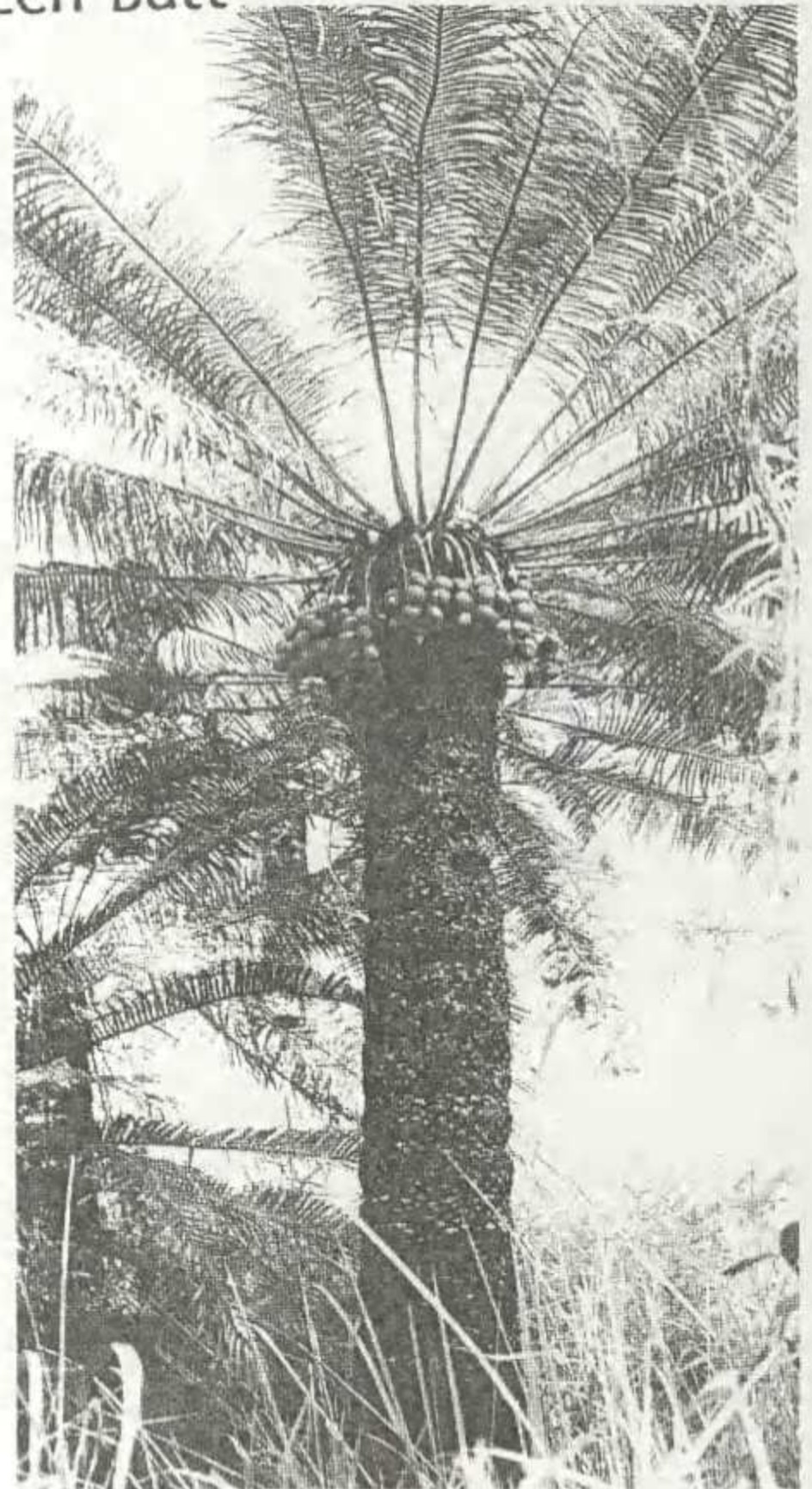
# CYCADS OF AUSTRALIA

by Len Butt

The peculiar manner in which the seeds of *Cycas* form around the margins of a spearhead-shaped appendage at the crown of the plant indicates a very primitive beginning and being very old in the evolutionary scale.

There are several sound methods of identifying *Cycas* - the quickest and surest being an examination of the leaf fronds. All the pinnae on each side of the rachis have a prominent vein or nerve running centrally along each surface. This does not occur in either the *Macrozamia* or *Lepidozamia* genera. Further, the male cone of some *Cycas* forms centrally from the crown and has a brilliant orange coloration. This I have observed in *Cycas media*, *C. normanbyana* and *C. Kennedyana*. So far, I have not found multiple male cones in these species. In *Cycas* the seeds are borne on the margins of megasporophylls which are incurved in a nest-like group at the crown of the plant or hang down between the bases of the fronds where they join the caudex. The soft buff coloured terminal appendage of each sporophyll is generally toothed along its edges, and the orange fleshy seeds fit around the margins between the tooth flanges. In the case of *Cycas media*, the circle of pendant seeds appear and hang just under the circle of fronds at the crown of the plant. See the beautiful colour plate on page 36.

*Cycas media* is the common *Cycas* of the east coast of central and northern Queensland, occurring in rainforest and in eucalypt forest. It is variable in height and form, and can vary so much that maybe natural crossing with other *Cycas* does occur. Near Cardwell, North Queensland, I found at least three variants growing within a twenty metre circle, fire-blackened, but with great healthy rejuvenation in the fronds. Colour variation of leaves was from powder blue, dark green to pea green. All leaf fronds were young and at the same stage of rejuvenation.



*Cycas media*

A tree growing at Behana Creek, North Queensland. This is a female tree, the fruit approaching maturity, hanging like a collar around the top of the trunk. Prior to maturity, the fruit stands up on the top of the trunk.

Photo: Mrs. F.B. Bosworth.

(Reprinted from "Australian Plants", Volume 13, No. 101, December 1984, with the kind permission of the author and the editor.)

This is the final article on the Cycads of Australia. Ed.

# HOW OLD IS THAT CYCAD?

## BY GRAHAM COX

Although some measurements were taken as early as 1962 the height and girth of most of the cycads in the collection of my late mother-in-law, Kay Mullins, were measured for the first time during the period 1973 to 1975. Girth was measured close to ground level and height was measured from ground level to the top of the crown. The fastest growths in height were recorded for:

### E. tranvenosus

an average of 4.9 cm a year over a period of thirteen years.

### E. natalensis

an average of 4.1 cm a year over a period of sixteen years.

### E. paucidentatus

an average of 4.1 cm a year over a period of seven years.

The fastest growths in girth were recorded for:

### E. transvenosus

an average of 6.4 cm a year over a period of thirteen years.

### E. natalensis

an average of 5 cm a year over a period of sixteen years.

### E. altenstenii

an average of 4.5 cm a year over a period of fifteen years.

The slowest rates of growth in relation to both height and girth were recorded for *E. friderici-guilielmi* and *E. ghellinckii*. One specimen of *E. ghellinckii* did not grow in height at all over a period of seventeen years and its girth over the same period expanded by only 4 cm.

The best gain in height for an *E. ghellinckii* was 12 cm over a period of fifteen years. This was marginally better than the fastest growing *E. friderici-guilielmi* which achieved a gain in height of only 10 cm over the same period. If this rate of growth is representative of what occurs in the plants natural habitat, a specimen of *E. friderici-guilielmi* which is one meter tall would be more than 150 years old.

Cynthia Giddy, in her book on the Cycads of South Africa, records that the well known *E. longifolius* at Kew has grown at an average annual rate of 2.5 cm under greenhouse conditions. The specimens in the Kay Mullins collection have grown at a much slower rate and have averaged about 1 cm a year. For example, a male specimen which was 76 cm tall in 1962 had grown to only 100 cm in 1989.

Other cycads which have grown in height at an average annual rate of about 1 cm are *E. latifrons* and *E. ferox*.

The average annual growth rate of a cycad can be deceptive as growth rates tend to accelerate with age. For example, an *E. leboomboensis* which was 44 cm tall in 1974 had grown to 85 cm in 1989 to give an average annual rate of growth of 2.7 cm. During the period 1974 to 1982, however, the average annual rate of growth was only 1.6 cm, whereas in the ensuing period of seven years, the average annual rate of growth accelerated to 4 cm.

Appended at the end of this article is a table showing the growth patterns of three specimens of *E. natalensis*. It will be seen that the rate at which these cycads produced new leaves was similar but that the rate of growth varied in accordance with the size of the cycad. Although not shown in the table, the growth of all of the 3 specimens took place at an accelerating rate.

The smallest specimen (No 1) gained only 4 cm in height during the first seven years but put on 23 cm in height during the next seven years. The middle specimen (No 2) gained 23 cm in height during the first eight years and put on 22 cm in height during the next seven years. The largest specimen (No 3) gained 33 cm in height during the first nine years and put on another 32 cm during the next seven years to give an annual average growth rate of 4.6 cm for the final period.

Many cycads were grown from seed but growth records were not kept for seedling. Growth is, however, very slow and it is estimated that in the case of *E. natalensis* the stem of a plant grown from seed would be of the order of 5 cm or 6 cm in height above ground level after a period of about ten years. The growth of a basal sucker on the other hand can be very rapid.

The basal sucker of an *E. natalensis* attained a height of 55 cm in ten years and coned in the seventh year. This exceptionally fast rate of growth is probably accounted for by the fact that the parent plant died. A normal rate of growth for a basal sucker of a mature *E. natalensis* would appear to be of the order of 20 cm over a period of ten years.

How old is that cycad? The size of the plant does not provide an easy answer to this question as growth tends to accelerate with age and growth rates differ between different specimens of the same species. The age of a 2 meter tall specimen of *E. natalensis*, or *E. altenstenii*, grown from seed is likely to be somewhere between seventy and one hundred years. On the other hand, the plant might be only fifty years old if it suckered from the roots of its parent.

*E. natalensis*

	YEAR	LENGTH	GROWTH	GIRTH	GROWTH	SEX
No. 1	1975	23cm.		70cm.		Unknown
	1989	50cm.	27cm.	121cm.	51cm.	
Average growth per annum			1.9cm.		3.6cm.	
New leaves		(11) 1974, 1975, 1976, 1977, 1980, 1981 (Jan. & Nov.) 1982, 1983, 1984, 1987				
Conings		Nil				
No. 2	1974	56cm.		105cm.		Female
	1989	101cm.	45cm.	155cm.	50cm.	
Average growth per annum			3cm.		3.3cm.	
New leaves		(12) 1975, 1976, 1978 (Jan. & Dec.), 1979, 1980, 1981 1982, 1984, 1986, 1987, 1989				
Conings		(2) 1983, 1988				
No. 3	1973	150cm.		127cm.		Female
	1989	215cm.	65cm.	207cm.	80cm.	
Average growth per annum			4.1		5cm.	
New leaves		(11) 1973, 1974, 1975, 1977, 1979, 1981, 1982, 1986 1987 (Jan. & Dec.) 1989				
Conings		(4) 1977, 1981, 1985, 1989				

# SOWING CYCAD SEED IN A WAY THAT GUARANTEES GERMINATION

by Julius Brunner

Due to the fact that cycad seed is very difficult to obtain in Austria and that germination often takes too long (longer than the three months than an Austrian summer lasts) to allow an adequate development of the seedlings, I had to work out a method that guarantees germination.

I sow the seed under sterile conditions *in vitro*, i.e. in flasks, on an agar-solidified medium which has proved ideal for orchid seed germination. Its ingredients are listed in the literature on orchid cultivation.

First, the hard shell of the cycad seed is carefully removed and the internal megagametophyte is sterilised in a calcium hypochlorite solution for about 10 minutes (this solution must be kept in a tightly-sealed bottle and can be stored for six months at the most). In a sterile room the seed is now placed on the agar-based medium in flasks which are closed with cotton-wool and hermetically sealed with polythene foil to prevent the contents from drying out. In my experience, germination can start in a few days but in some cases can take up to two years.

At the start the megagametophyte is white in colour and starts to turn green shortly before germination. As soon as the hypocotyl emerges, the seedling must be transferred to pots with sandy loam. The germinating seed can be removed from the flask by means of a long thin needle - if the megagametophyte is pieced by 1-2 mm, there will be no damage. It is advisable to add fungicide to the soil medium (about 5g to 10 litres soil) to prevent mycosis. It may be of interest to note that the megagametophyte often continues to be part of the plant for many years without changing.

The above method appears to be beneficial in two respects. Firstly, the risk of rare seed not germinating is minimised. Secondly, even old seed, that has started to dry out, can be recovered in this process. When the seed is infertile, then the above method will of course fail to bring about germination. However, it may be possible that the gene-mutative chemical, colchicine, can be used to stimulate the haploid chromosomes of the ovary to double - a method which has been used for the propagation of some foreign tree species which, for reasons unknown, are sterile when cultivated in Austria.

Julius Brunner writes from the Bundesgärten Schönbrunn, A-1131, Vienna, Austria.



Seed of *Encephalartos friderici-guilielmi* germinating in a flask.



Germinating seed of *Cycas armstrongii* insect damaged areas have been closed by means of a general-purpose adhesive.

## FROM THE BOOKSHELF

### CYCADS OF AFRICA : DOUGLAS GOODE

Published by Struik Winchester; 256 pages; retailing at R 160.

Recent media coverage of the spate of illicit cycad "deals", both nationally and internationally, has focussed public attention on cycads. The long-awaited appearance of Douglas Goode's excellent text *Cycads of Africa* is thus particularly opportune. But it is no rapidly-constructed story jumping on a publicity bandwagon; it is the result of nearly 21 years of dedicated and talented effort in the field, at the desk and at the easel.

The 256-page work provides a detailed account of the 52 known species of *Encephalartos* which, together with *Stangeria eriopus* and *Cycas thouarsii*, comprise the cycads endemic in sub-Saharan Africa. The book is as up-to-date as conceivably possible and includes the 8 *Encephalartos* species which have been described since 1985 (*E. cerinus*, *E. dolomiticus*, *E. dyerianus*, *E. ituriensis*, *E. kisambo*, *E. middelburgensis*, *E. sclavoi* and *E. turneri*). A concise but accurate description for each species - with a minimum of botanical jargon - is accompanied by a detailed water-colour of the whole plant in its natural habitat and followed by diagrammatic paintings of leaf and cone structures. The illustrations are aesthetically delightful and scientifically accurate. The book abounds with tit-bits of fascinating information and portrays an important conservation message in an all-too-common reference to populations which are severely depleted as the result of plundering.

A second theme which comes through in this book is the interaction between cycads and the environment. The author refers frequently to, and illustrates, relations between the cycads and various birds, insects and mammals, many of which play specific roles in pollination or seed dispersal.

*Cycads of Africa* is a beautifully-produced and important reference book which cycad-lovers will undoubtedly adopt as a second Bible. The Goode book will also go a long way to stimulating interest amongst others too.

Roy Osborne.

## HEENAN COLLECTIONS : WHERE ARE THEY NOW?

David Heenan, son of Denis Heenan, mounted expeditions in 1973 & 1974 to collect cycad data and specimens from central and east Africa. Many of the plants collected have since changed hands and in many cases, the original identifications seem to have been lost. In a project to re-evaluate the Heenan collections, Roy Osborne is keen to make contact with the present owners of these plants. He offers to visit the owners and clarify (if possible) the identity of the specimens. Many of these are now at cone-bearing age and the pool of information will lead to the possibility of pollinating and collecting seed crops from these species. Please contact Roy (tel 031-866953) if you have any information as to the present whereabouts of these specimens.

## NEW DIRECTOR FOR NATIONAL BOTANICAL INSTITUTE

The Department of Environmental Affairs has announced that Brian Huntley is to be appointed as Chief Director of the National Botanical Institute. The post arises from the merger of previously-separate units known as the National Botanic Gardens and the Botanical Research Institute. In his previous position with the CSIR/FRD, Brian has taken a keen interest in our Society and we trust his continued interest will lead to a positive interaction in the times ahead. We congratulate him on his appointment and wish him a sincere "alles van die beste" for the future.

## CYCAD LEAF WAXES

Avid readers of this magazine may recall an article on the analysis of cycad leaf wax deposits in *ENCEPHALARTOS* 12: 26-27. The authors, Roy Osborne, Maria Luiza Salatino and Antonio Salatino have continued these studies and the first of a series of scientific papers on their investigations has appeared in the international biochemical journal *PHYTOCHEMISTRY* 28: 3027-3030, published at the end of last year. Reprints of the paper, entitled "Alkanes of Foliar Epicuticular Waxes of the Genus *Encephalartos*", may be obtained from Dr Osborne (20 Maryvale Road, 3630 Westville). The next phase of the project will involve a survey of the leaf wax deposits of the meso-American cycads and work has already commenced in this regard.

GOODE

BOOK

## LAUNCHED

Douglas Goode's book "*Cycads of Africa*" (see review elsewhere) was officially launched in Durban on 5 December 1989. The function was jointly organised by the Cycad Society, the Wildlife Society and the Durban Natural History Museum. Speaking at the opening Dr Brett Hendey, Director of the Museum, said that this was one of the most successful events ever held in the museum. A cycad-orientated display greeted visitors to the Museum after which Roy Osborne and Douglas Goode took the audience on a slide-show-conducted-tour around cycad habitats in Africa. A cheese-and-wine party completed the event during which approximately R300 was raised in donations towards the CYCAD 90 CONFERENCE FUND. What was especially pleasing was the way three different organisations had co-operated together for a common purpose and many new acquaintances were established.

**THE NATAL MERCURY, TUESDAY DECEMBER 12, 1989**

### Cycad work comes of age



Happy 21st celebrations. Mr Douglas Goode (left) launched his book *Cycads of Africa* last week after 21 years of meticulous research and time-consuming illustrations. Admiring Mr Goode's book are Mr Harry Gerber (centre), chairman of the Natal branch of the Southern Africa Cycad Society, and Dr Roy Osborne, president of the Southern Africa Cycad Society. The book launch also marked the beginning of a fund-raising campaign aimed at getting five cycad specialists, including Dr Osborne, to the Cycad 90 Conference in Australia next year.

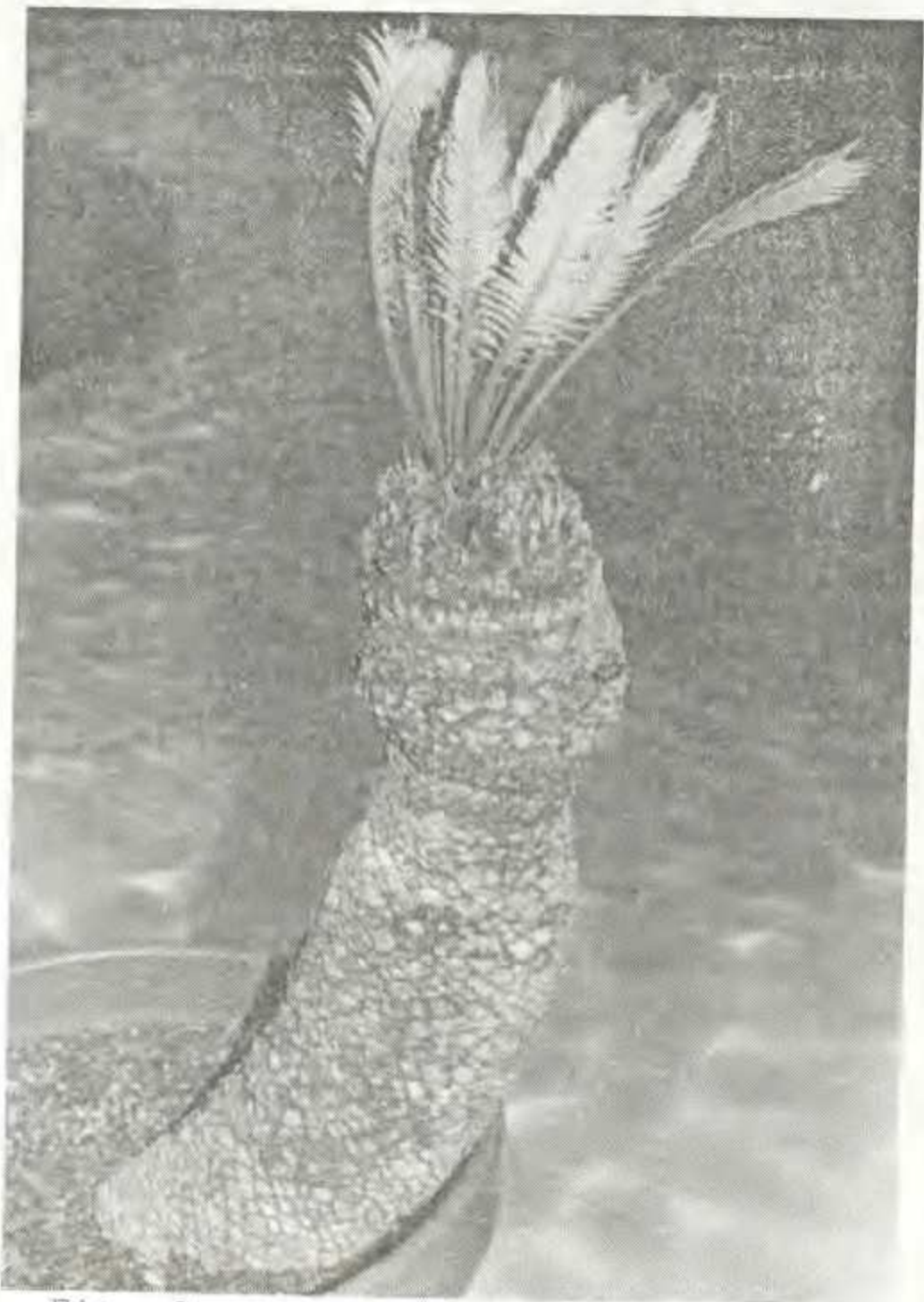


Fig 3 - a new flush of 15 leaves.



Fig 4 - *E. altensteinii* which recovered from crown rot.

## NATAL SECTION KRANTZKLOOF EXCURSION

The December excursion of the Natal Section of the Society was in the form of a braai get-together at the North Picnic Site of the Krantzkloof Nature Reserve on Sunday 2 December 1989; we were especially pleased to see members from Pietermaritzburg and Greytown who travelled to join us for the event. After the braai, members took one of the trails through the reserve to see - although at a distance - some impressive specimens of *Encephalartos natalensis* in habitat on the steep cliff faces.



Members of the Natal Section preparing a braai at the Krantzkloof picnic site. Left to Right are: Hermann Kistner, Roy Osborne, George Walters, Tinus Barnard & Yvonne Barnard.



EVIDENCE OF CYCAD POACHING AT  
KAAPSEHOOP BY NEIL MUNRO

With the forthcoming article by Roy Osborne on Encephalartos laevifolius for ENCEPHALARTOS No. 19 and having visited the area some time before, I decided to travel down to Kaapsehoop to view the species being featured as a follow up excursion. The last time I had been in this area was in June 1983 so I took the photo album I had made in that year of the Encephalartos laevifolius and set off to update my photographs.

I entered the State forest and set about finding the cycads I had previously seen in 1983. Working from memory and using the old photographs as a reference I was soon on the trail and eventually found the two mature specimens that grow on the edge of a cliff that towers a few kilometers from the N4.

Both plants were in tact and all seemed well I then proceeded to the next group of plants that I knew of.

I was busy photographing this group and using my old photo's as a reference was horrified to see that the many plants that grew at the base of a large specimen had been removed. At this point I was apprehended by a forestry official who demanded to know what I was doing and if I had the necessary permission to be in the forest. I introduced myself and complimented the official on his speedy apprehension of my encroachment whereupon he explained to me that the forest is now under constant guard by all officials using sophisticated control methods and all suspicious vehicles are checked and the presence of such people must be explained in detail and the necessary permits for such a visit must be produced. My compliments to such management, but has it not come too late?

A mere 6 years ago there were probably many more cycads growing in this locality that I did not see but from the before and after photographs I have shown in this article it is evident that heavy poaching has taken place.

So take heed - this forest is now well protected and patrolled.



Fig. 1. - a cluster of Encephalartos laevifolius photographed in June 1983.



Fig. 2. - all that remains is the 1.8m upright specimen. The smaller plants at the base have been removed.



Fig. 3 - a group of 4 mature specimens of E.laevifolius plus basal suckers photographed in June 1983.



Fig. 4 - the same group photographed in August 1989. Note that the two mature specimens on the right have been poached as well as the basal suckers.

## UNUSUAL CYCADS



It is not so much the cycad in this picture that is unusual, but its locality. This fine male specimen of *Encephalartos natalensis* was photographed growing in the premises of a second-hand car dealer in Old Main Road, Pinetown, Natal. The office was previously the homestead of one of the locally well-known Dales family members.

## SAVE THE CYCADS !

In October 1989 the Wildlife Society of Southern Africa launched its *Save the Cycads* campaign in an effort to increase public awareness of the need to conserve cycads and specifically to raise funds for cycad conservation projects. Director of Conservation for the Wildlife Society, Keith Cooper, will be working in liaison with our Society in management of the campaign. The first fruits of the programme have been borne in an excellent feature entitled "Save the Cycads!", written jointly by John Comrie-Greig, Keith Cooper and Douglas Goode, which has been published in *AFRICAN WILDLIFE* 43(6): 298-300 of Nov-Dec 1989. Further details will be found in issue 44(1) of the same magazine. With its circulation of approximately 35000, the campaign will reach a large, and hopefully responsive, readership.

Contact for further information:-

Keith Cooper  
Director (Conservation)  
The Wildlife Society of Southern Africa  
P O Box 2985  
4000 DURBAN

Readers are invited to write to the editor (see address elsewhere). Where applicable, experts will be asked to deal with specific questions.

Lesers word genooi om aan die redakteur te skryf (sien adres elders). Waar van toepassing sal kenners gevra word om spesifieke vrae te beantwoord.



Next time readers visit the Sudwala Caves allow some time to wander through the Dinosaur Park. The most effective planting of *E. humilis* ensures that one has journeyed through the past.

Photo: Neil Munro

## THE PLATYMERUS WEEVIL

Rolf G. Oberprieler, Senior Agricultural Researcher at the National Collection of Insects, Plant Protection Research Institute (P/Bag X134, Pretoria 0001) has published a report in which he describes the discovery, re-discovery, and his own present collection, of the cycad weevil *Platymerus* on specimens of *Encephalartos friderici-guilielmi* in the Eastern Cape, and goes on to pose interesting questions on the insect-plant relationship. The paper is published in issue No. 8 (1989) of PELEA, Journal of the East Cape Game Management Association, pages 50-54. Any readers interested in this topic can write to Rolf at the above address for a copy of the paper.

## CONING AGE OF CYCADS

Willie Tang, research associate of Fairchild Tropical Garden, is gathering information on the time of first coning of cycads in cultivation. His report will be of direct interest to all serious cycad growers. For example, we know that *Encephalartos transvenosus* can produce female cones within 12-15 years from germination. However, little is known about most other cycad species. Thus Willie would be most grateful to hear from readers who can contribute data on cycad species, sex, age at first coning, and any incidental cultivation details. Please write directly to Willie at the Fairchild Tropical Garden, 10901 Old Cutler Road, Miami, Florida 33156, USA.

## CYCAD SEED DISPERSAL

Willie Tang, research associate at Fairchild Tropical Garden, has recently completed a study of the seed dispersal of *Zamia pumila*. His report appears in the *Canadian Journal of Botany* 67: 2066-2070. Two sites were studied - one in the Everglades National Park and one near Miami itself. Willie found that dispersal occurs at two main times in a six-month period; one after seed-ripening and the other near the time of seed germination. Larger seeds, with a higher degree of pulpy flesh, are favoured by the birds and small mammals which distribute the seeds. Seeds are generally deposited under shrubs. Since seed germination is better in the shady areas, the study suggests that there is a plant-animal interaction with the concept of selection for a process where seeds end up in a "safe site" for their future survival.

This is an interesting but highly technical paper. Reprints may be obtained from Willie Tang, Fairchild Tropical Garden, 10901 Old Cutler Road, Miami, Florida 33156, USA.

## NATAL SECTION : NEW COMMITTEE

The 1990/91 Natal Section Committee has been elected. Harry Gerber, well-known to both cycad and succulent plant people, is the Section Chairman and the Regional Committee comprises Gerald Camp, Robert Campbell, Bryan Chadwick and Roy Shooter.

## IN MEMORIAM : JOHN HENDRICKS

It was with regret that we heard of the death on 30 August 1989 of USA cycad enthusiast John George Hendricks. John, of Statesville, North Carolina, passed away at age 68 after a long illness. He was a prolific correspondent and contributed many cycad articles to various journals. His particular interest was in cycad chromosome numbers and more generally in cycad taxonomy. He collaborated extensively with Roy Osborne and Dennis Stevenson in compiling the various Cycad "World Lists". We extend our condolences to his wife Merry and his other friends and relatives.

The following tribute has been received from Dennis Stevenson:-

*"Although I never met John Hendricks in person, for the past 8 years I had extensive correspondence and numerous telephone conversations with him both when he lived in Ohio and in North Carolina. At times our telephone conversations were monthly and often 1-2 hours in length. Unfortunately, in the past couple of years our contact diminished, in part because of distance and in part because of John's extended bouts with emphysema. I am sure anyone who has corresponded with John over the years will miss his long (often voluminous) hand written letters. After reading these letters, there were times when I wished that John's teachers had spent a more time on penmanship but I am sure that he had the same opinion about my teachers.*

*I last spoke with John just before a trip to Peru with Aldo Moretti, Luciano Gaudio and Jean-Pierre Sclavo. It was customary for me to speak with John before and after my trips to the Neotropics because he was always interested in what I had seen in the field. Unfortunately, I did not speak with him after the Peru trip where we found a Zamia which John and I had spoken about for many years.*

*John's interest in and knowledge of the cycads was extensive. He was interested in all aspects of cycadology but his particular interests were in biochemistry and cytology in relation to systematics. His interest in biochemistry was a continuation of studies during his student days. He collaborated with Prof. Arthur Bell and students and supplied them with material for study. His interest in cytology was in conjunction with Prof. Walter Flores of Wake Forest University and concentrated mainly on Cycas.*

*Although John was knowledgeable about all genera of cycads, his favorite genus was Cycas and he was the most knowledgeable person I have known concerning Cycas. I learned much about this genus from John or through his questions which would lead me to the library or greenhouse. Cycas is probably the most poorly*

*understood genus in the cycads, but John had a good grasp of the diversity in the genus particularly growth forms in Southeast Asia. I have recently begun working on this genus after many years of prodding by John, and I know that this task is going to be much more difficult without his input.*

*All of us who have worked with John over the years are going to miss his insight and help. Certainly our knowledge of the cycads has increased and benefited through his interest and efforts."*

## IN MEMORIAM : SALLY GELDENHUYS

The President and Committee note with regret the tragic death of Mrs Sally Geldenhuys (Sally Cycad) of Pongola last year.

## CYCAD 90 - LAST PLEA

This is essentially a last plea to members who have not contributed anything to the fund for sending the five southern African representatives to the CYCAD 90 Conference in Australia in July this year. At the time of writing, significant donations had been received from some business establishments, including AECI Ltd, Southern Sun Hotels, Checkers and the Pick 'N Pay group. A small number of our members have been generous and fund-raising events have also helped swell the funds. We would be very grateful for any donations which may make the difference between some of our representatives being able to go or not.

Donations can be sent to Dr Roy Osborne, CYCAD 90 Committee, 20 Maryvale Road, 3630 Westville.

## NEW CONSERVATION ACT

A new Environmental Conservation Act (Act No. 73 of 1989) came into effect toward the end of 1989. This Act "tidies up" some of the previous conservation legislation in South Africa. Of particular importance to our Society, it sets out very clearly the general policy for protection of biotic diversity [clause 2(1)a], provisions for the declaration of areas of protected natural environment [clause 16(1)] and for the establishment of special nature reserves [clause 18(1)]. The powers and responsibilities of the Minister of the Environment and his various advisory Councils and Committees, are also spelled out in the Act. The Act is published in *Government Gazette* 11927 of June 1989.

## LETTERS BRIEWE

Dear Editor,

I wish to briefly comment on Dr. Piet Vorster's report on page 30 of ENCEPHALARTOS No. 20, 1989 in respect of cycads discovered at Mariepskop. I wish to confirm that Piet Vorster is probably the first to have discovered the Encephalartos laevifolius at Mariepskop. As forest manager in charge of Mariepskop at that time I independently "discovered" the same plant groups some 10 days later, while investigating the spread of a threatening fire in the Blyde valley below Mariepskop, and I discussed this discovery with Piet at that time. The military authorities are however, according to my information, not responsible nor blame-worthy for the disappearance of over 80% of the cycad population concerned, as intimated in your report. The local TPA Nature Conservation authorities, on whose property the cycads occurred, were reported to have removed a large number of plants themselves. This matter was reported by me and resulted in an official investigation conducted by the Pretoria headquarters of TPA Nature Conservation. I and my forest guard, Mr. Sam Mokhome, testified during the investigation concerned. I have not heard about the outcome of this investigation, but I do feel obliged to clear the defence force for the tragic reduction in this very localised, endemic cycad population.

Joh Scriba  
Director  
Saasveld School of Forestry (Port Elizabeth Technikon)  
Private Bag X 6531  
GEORGE  
6530

## LETTERS BRIEWE

### MEMBER NUMBER 1000

Although the Society had to delete 71 members from the membership list due to non-payment of fees, our number of members showed a healthy growth of 165 new members since January 1989. The total membership presently is 673 of which 131 are overseas members.

It was therefore my privilege to allocate membership number 1000 to new member, Mrs. Hentie Barnard of Pietersburg on 27 July 1989.

Mrs. Barnard's interest was stimulated when she saw a friend's cycad collection. She immediately fell in love with the prickly plants and decided to apply for membership of the Society.

Living on a farm, her first love and interest has always been the nature and animal life. Over and above the normal farm activities, Mrs. Barnard also grows proteas and breeds Rottweilers.

A truly active nature lover.

We wish Mrs. Barnard success in all her activities and trust that she will obtain pleasure from her membership of this Society.

Pieter Stroebel  
Membership Officer  
P.O. Box 189,  
PORT ELIZABETH 6000

Dr. Nico Henning (80 Cantonments Road, Lyttelton Manor, Verwoerdburg 0157. Tel: (012) 622704) asks all members who are willing to part with a few fertile seeds or seedlings of any Encephalartos species occurring north of South Africa, to contact him at the above address or Phone No.

Friderici guilielmi Seed for sale.  
R30,00 per 100 delivered in S.A.  
R40,00 overseas + postage.  
Apply. L. Forrester. Phone: 04562 2003  
CATHCART.



## Tycoon's Madeira 'palace' a paradise for rare cycads

ALL but 75 of the 698 rare cycads cleared for export to the Madeira Botanical Gardens have ended up in the grounds of a private mansion on the Portuguese island — belonging to ex-Johannesburg tycoon Joe Berardo.

This has been confirmed by officers of the commission of inquiry into Mr Berardo's export of the endangered plants who recently returned from Madeira after visiting the Monte Palace hotel. The hotel has been converted by Mr Berardo into a private residence.

They said there was no indication of where the missing cycads were. Mr Berardo and landscaper Steve van Blommestein — who went to Madeira last August to transplant the cycads — refused to speak to the commissioners except through their lawyers.

Mr Berardo's wife Caroline — who is still in South Africa — said in April this year the cycads were "waiting to be transplanted" to the Botanical Gardens, but last week

### Report: SAM SOLE

Dr Piet Vorster, curator of the Stellenbosch herbarium, told the commission the plants appeared to be planted permanently in the grounds of the Monte Palace.

Madeira-born Mr Berardo — who left South Africa abruptly early this year when his company, Johannesburg Mining and Finance Corporation, plunged into financial disarray — insisted at the time he would soon be returning to SA.

However sources in Madeira claim the entrepreneur — who arrived in South Africa virtually penniless 25 years ago — has transferred his extravagant lifestyle back to the island, and has made major financial acquisitions.

Earlier the commission heard that Mr Berardo had valued the cycads at R22 300 for exchange-control purposes, whereas they were worth close to R1 million on the international market.

The commission is to wind up its hearings next month, after which commissioner Charles van Zyl will report his findings to the State President.

However the crucial question to be answered by the inquiry will be who granted permission for the export in contravention of international conservation laws and "whether any improper influencing of anyone occurred."

Democratic Party MP Rupert Lorimer, whose questions in parliament were instrumental in launching the inquiry, has said it appeared people at a "very high level" may have helped bend the rules so the shipment could leave the country.

Meanwhile the finances of a company owned by Mr Berardo have been frozen, pending an income-tax probe. Aujack Investments (Pty) Ltd was the company which issued three cheques for a total of R285 000 for the purchase of the cycads in SA.

### A RARE FIND

■ Tycoon Joe Berardo's magnificent Madeira mansion has become a home for rare South African cycads.

■ Now a commission of inquiry is trying to find out how they got to their new home.

# Lift-off for the Save the Cycads Campaign

Barry Martens

WHILE South Africa is a key player in the current emotive international debate over the sale of ivory, its reputation as a conservation leader is likely to be challenged in another area: the illegal international trade in cycads.

The Wildlife Society of Southern Africa this week launches a Save the Cycads Campaign to coincide with the publication of Durban man Douglas Goode's definite book *Cycads of Africa* (Struik Winchester, R150).

Meanwhile the Convention for International Trade in Endangered Species (Cites) meeting is currently in progress in Switzerland.

South Africa and Zimbabwe are opposing a proposal to totally prohibit the sale of ivory.

The meeting, however, will deal with other issues as well — and South Africa's role in protecting its precious cycad stocks is likely to be featured, particularly in the light of the scandal which blew up earlier this year over the export of 698 of these extremely rare plants to Madeira.

The exportation was done by Johannesburg mining firm boss Joe Berardo, said to be a friend of former State President Mr P.W. Botha.

A commission of inquiry is currently investigating the circumstances surrounding the export of these plants estimated to be worth R700 000.

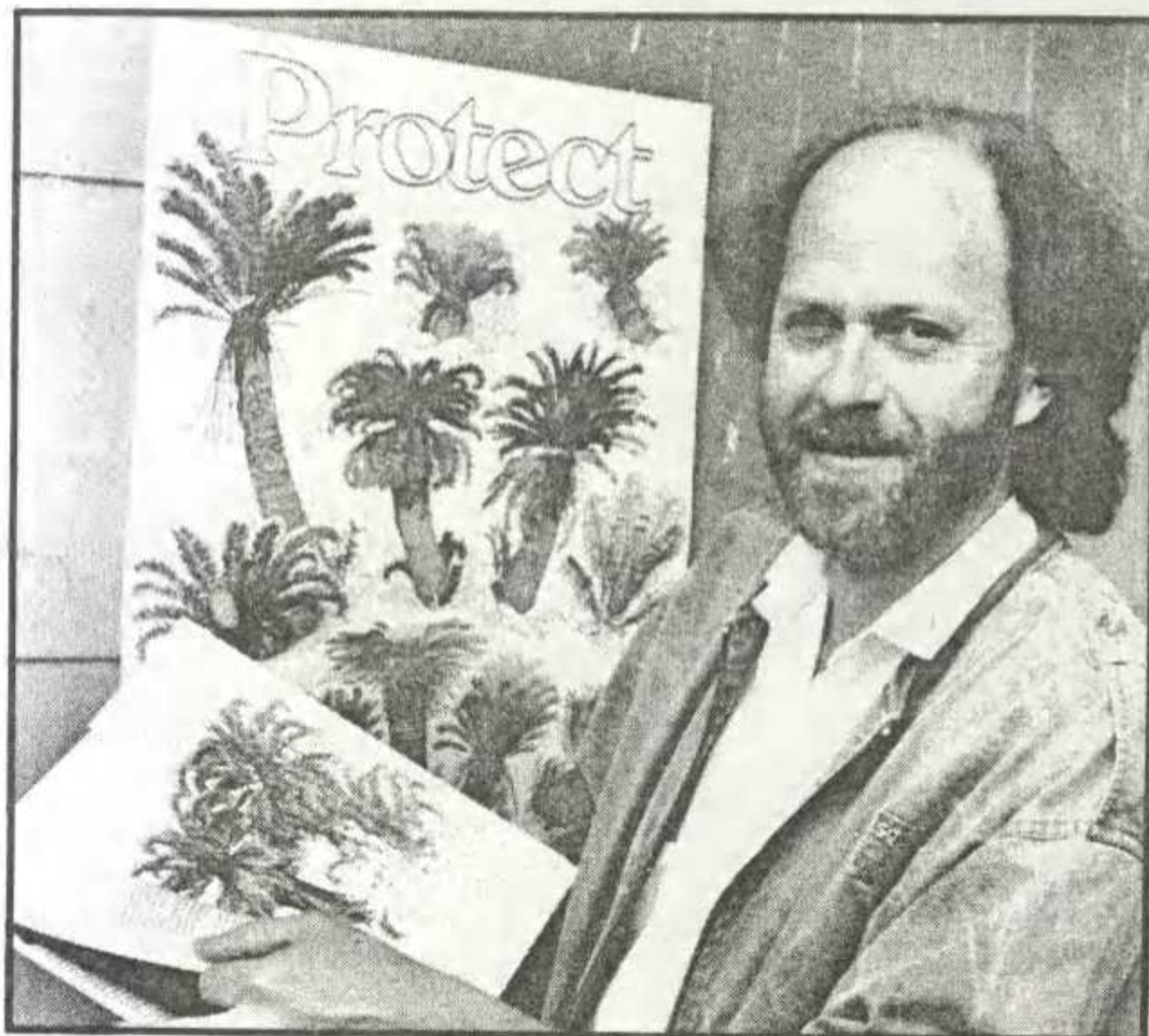
However, it has been stalled by the departure of Mr Berardo from South Africa.

A spokesman for the commission said it was likely to sit again early next month. He said the inquiry was at a "very sensitive" stage.

Plans for the commission to visit Madeira where Mr Berardo now lives had not been finalised, he said.

The export deal was featured last week in the London newspaper, *The Observer*.

A report said the "illegal international



□ Douglas Goode of Durban whose book on cycads will be published this week

trade" had been linked to a political scandal in South Africa.

The plants, for which an export licence was granted, and which were supposedly bound for the official botanic gardens in Madeira, had found their way to a private hotel owned by Mr Berardo, it said.

The newspaper said the export permit had been granted despite the fact that cycads were listed under an international agreement which restricts trade in endangered species.

And it reported that opposition MP Rupert Lorimer had claimed in Parliament that "pressure was exerted by someone very high up in government" to enable the plants to leave the country.

Some of the rarest plants in the world were included in the consignment, some on the verge of extinction.

South African cycad expert, Cynthia Giddy, said she fully expected the Madeira export affair to be raised at the current meeting of Cites which continues until Thursday.

She said as South African representative of the IUCN (which administers Cites) Species Survival Commission, Cycad Specialist Group, she had forwarded documentation about the affair to the specialist group's chairman.

In a statement the society said "it was deeply concerned about the increasing removal and sale of cycads from their natural habitat in many areas of Southern Africa".

Keith Cooper, the society's director of conservation, said: "As Black Rhino have become endangered in the animal kingdom, so

cycads have taken this role in the plant kingdom.

"Several species are threatened with extinction and some are already extinct in their natural state."

The launch of the local campaign takes place in Pietermaritzburg at 5.30 pm on Thursday at the Africana Book Collectors shop, 266 Prince Alfred Street, Pietermaritzburg. Douglas Goode will present an illustrated talk on the plants and Keith Cooper will give a short address.

□ Anyone wishing to attend should contact Dennis Slotter of Africana Book Collectors, telephone (031) 949064.

# SA linked to trade in rarest plant

## Botany

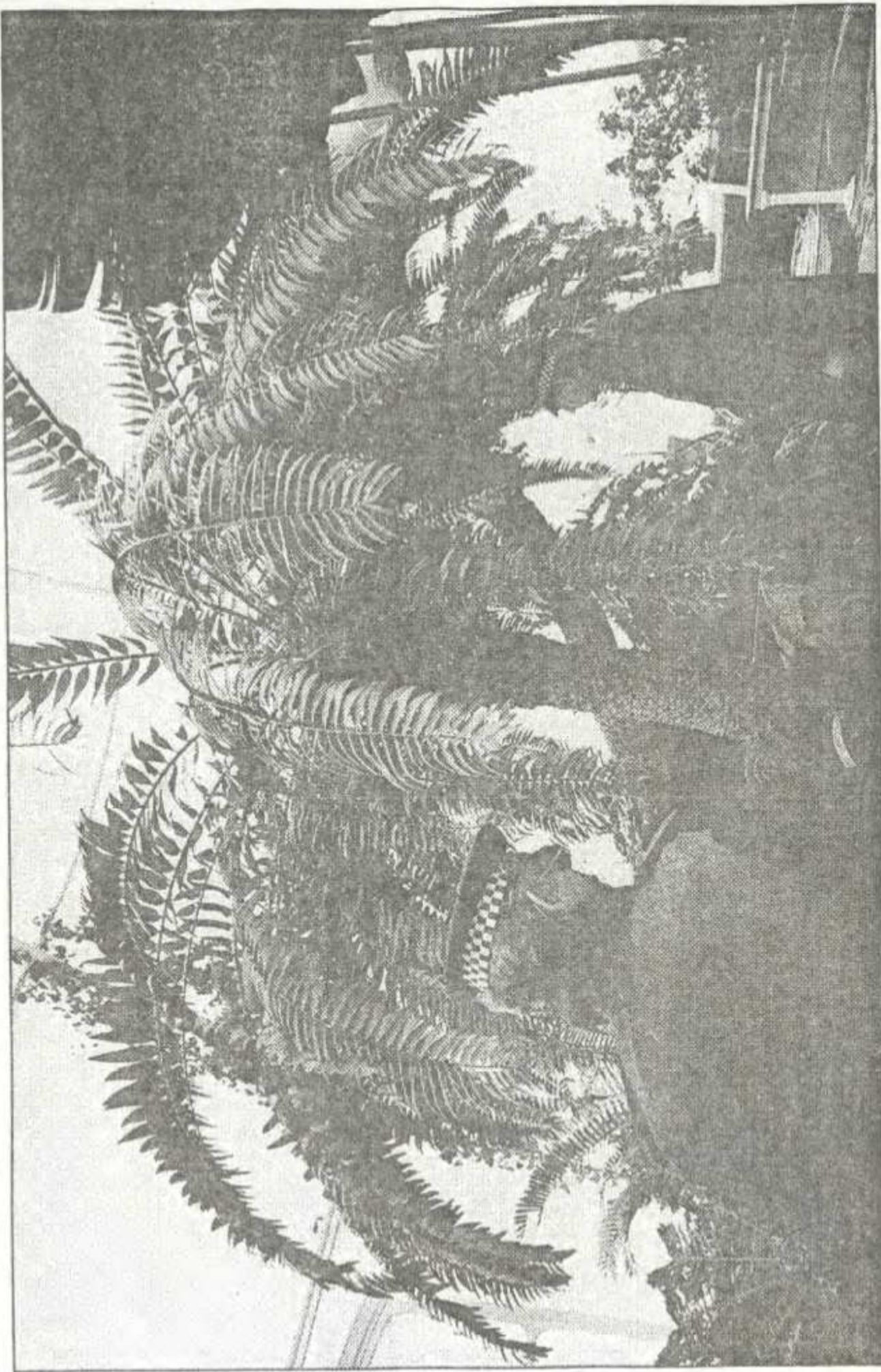
**Andi Spicer** reports on a political scandal over illegal exports.

AN ILLEGAL international trade in some of the world's rarest and most primitive plants, cycads, has been linked to a political scandal in South Africa.

The plants, which were granted an export licence and were supposedly bound for official botanical gardens, have instead found their way to a private hotel in Madeira owned by Joe Berardo, the chairman of an influential Johannesburg mining company and a friend of ex-President P. W. Botha.

The cycads — known as living fossils, because they have not evolved in 150 million years — were given export documentation even though they are listed under an international agreement which restricts trade in endangered species. Among the shipment of 725 cycads were *Encephalartos Woodii*, the world's rarest plant. *Woodii* is on the threshold of extinction — only seven male plants remain, three of them in Kew Gardens. All the known female plants have died.

Berardo's links with the rul-



*Rich foliage: Kew Gardens houses three of the seven remaining plants of the most endangered cycad species. Photograph by Neil Libbert.*

ing National Party and senior Cabinet Ministers have been raised in parliament in Cape Town by opposition MP Rupert Lorimer. Lorimer claims that the regulations were 'bent' and that 'pressure was exerted by someone very high up in the government' to enable the plants to leave the country. Berardo is well known as a generous contributor to National Party funds.

South Africa has the largest ivory and rhino horns, the

variety of cycads, many of which are classified as endangered, rare or vulnerable. The specimens that reached Madeira were over 12 feet high and could only have been taken from the wild. They are slow-growing plants and were probably between 200 and 1,000 years old.

Cycads have become fashionable among the rich in Japan and the United States. Like

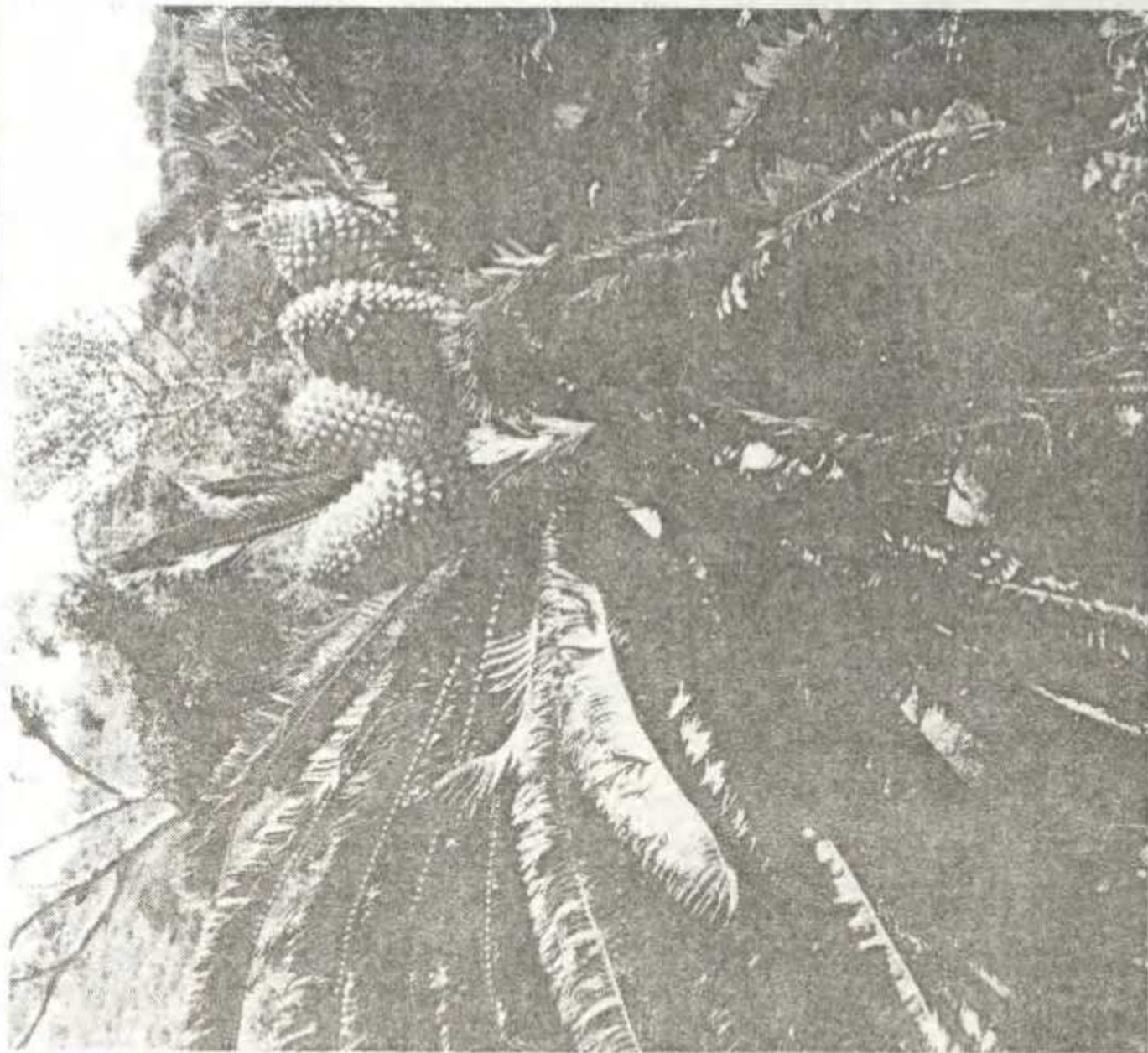
plants may also have been used to transfer capital out of South Africa, thereby circumventing currency restrictions on the rand.

Their value was given on the export licence as £5,000, but they could fetch as much as £150,000 on the international black market. A lorry stopped by police at a roadblock in the Orange Free State was recently found to have 110 cycads in the back, some more than 15 feet in

length. In the Eastern Cape, more than 550 cycads have been illegally removed from the wild in the last 10 months.

The Madeira shipment tried to exploit a loophole in the CITES agreement that allows export as part of a non-commercial exchange between scientific institutions if the plants are grown from seedlings. The slow growth rate of cycads and the size of the Madeira plants rules out such an explanation.

# Tough measures to counter Aged cycad graces park



THIS cycad in Settlers Park is estimated to be 500 years old. The illegal trade in cycads is one of the prime targets of a newly formed police unit.

By JENNY CULLUM

RARE cycads are now sold by the millimetre and one specimen is kept in a "cage" by Transvaal conservation authorities to protect it.

This is the background to the crack-down on illegal cycad operators, which has resulted in five prosecutions on the Reef, three of which are linked to the Eastern Cape.

The "cycad cult" resulted in a selling boom and some rare species were nearly wiped out, said conservationists.

These "dinosaurs of the plant world" have survived for millions of years with few changes in their strange, prehistoric appearance.

They are strictly protected and as an endangered species may not be uprooted, bought, sold, donated, exported, imported or transported without a permit from the Directorate of Nature and Environmental Conservation.

But as they achieved popularity as a status symbol in the garden — along

with antiques in the living room and a German car in the garage — illegal operators started cashing in.

Yesterday, a former Eskom official appeared in the Randburg Magistrate's Court on charges of illegal possession of cycads.

An Eskom employee will again appear at Randburg next month charged with illegal import and export of cycads.

Three Despatch men, members of an alleged cycad smuggling syndicate, are expected to appear shortly in the Uitenhage's Magistrate's Court, charged with dealing in and possessing the plants.

And a one-man commission of inquiry is investigating the export of endangered 725 endangered cycads to Madeira.

Mr Laurie Oates, regional representative for the western area of the Transvaal of the Directorate of Nature and Environmental Conservation, said there had been a tremendous illegal trade in cycads, especially the scarcer species and large plants.

Because cycads were so slow growing and male and female plants were needed for reproduction, prize specimens fetched high prices. The price was linked to size and today they were sold for prices from 42 cents to R4,30 per millimetre.

Recent prices paid for cycads from private sources or nurseries ranged from R2 000 to R7 100 for rare specimens.

Mr Oates said the "cycad in a cage" at the administration's nursery was a Natal species, *Encephalartos woodii*. Only a few male plants still survived.

They could not be reproduced, unless a female was discovered, although work was going ahead on experimental tissue culture.

Captain Piet Lategan, head of the recently formed SAP Endangered Species Protection Unit, at Pretoria, said at present they were dealing mainly with black rhino, elephants and cycads.

The emphasis on cycads was because they were an endangered species which

were being protected against those who were interested only in financial reward and could wipe them out.

He had been told that people "invested" in cycads as a financial move and they were an upper class status symbol. One of the cases investigated involved more than 1 300 cycads.

Legitimate cycad collectors and nurserymen welcomed action against cycad smuggling and illegal removal of plants from the wild, said a Port Elizabeth collector and member of the city's Cycad Club, Mr Charles Hewson.

He has about 400 cycads, one of which is 2 500 years old.

## Couple fined R2 000 after being caught with 13 cycads

By RAYMOND HARTLE

AN East London couple were fined R2 000 after they pleaded guilty in the Port Alfred Magistrate's Court yesterday to illegal possession of 13 cycads.

Trevor Berndt, 60, of 12 Turnberry Avenue, Bunkers Hill, admitted illegal possession of the endangered flora.

He was fined R1 500 or six months' imprisonment.

Berndt, who has a cycad nursery in East London, was acquitted on a second charge of illegally transporting the cycads.

Berndt's wife Pauline, 55, was fined R500 or three months' imprisonment for illegally transporting the cycads.

A Department of Nature Conservation law enforcement officer, Mr Braam Basson, said he stopped the couple on the East London road just outside Port Alfred on February 23 this year.

He found 13 cycads in a trailer. He also took possession of a cheque for R7 000 in favour of an Alexandria man, from whom Berndt had bought the cycads.

Mr Basson said cycads were protected flora and could not be transported, sold or donated without a permit. Permits could

not be transferred.

He said Berndt had produced two permits, issued to Mr M E Janse van Rensburg and Mr H Bosch, both of Alexandria, allowing them to sell cycads to a Mr E Pienaar, of Pretoria.

Berndt had said he was an agent for the permit-holders.

Mr Basson said if Berndt had been stopped by a law enforcement officer without knowledge of nature conservation regulations, this explanation would have been sufficient for him to evade prosecution.

He said the cycads in Berndt's possession included a very rare species found only in a small area near Alexandria.

If Berndt had sold the cycads, he would have made considerably more than R7 000.

Mr G Bell, for the defence, said Berndt had not removed the cycads from their natural environment.

He said that the accused, through his nursery, was ensuring the continued existence of the plants.

In respect of Berndt's wife, Mr Bell said she had been acting under the influence of her husband.

Mr P van Rooyen was on the Bench. Mr H van Zyl prosecuted.

The Natal Mercury, Monday, October 9, 1989.

## Illegal cycad collection 'alarming'

### Mercury Correspondent

JOHANNESBURG—The Eastern Cape regional office of the Cape Nature Conservation Department has, in a nine-month period, confiscated 450 cycads worth hundreds of thousands of rands, nature conservation official Jaap Pienaar said at the weekend.

This does not include the 374 cycads from the Dispatch/Uitenhage area — said to have a black market value of R500 000 — seized in a weekend raid on a luxury home in Woodmead in a joint operation between the Cape and Transvaal Nature Con-

servation departments and the Endangered Species Protection Unit of the S A P.

Eskom employee Ernie Bouwer, of Packard Street, Woodmead, was arrested on charges of illegally exporting cycads from the Cape, illegally importing cycads to the Transvaal and illegal possession of cycads.

He was released on a warning and is expected to appear in the Randburg Magistrate's Court today.

Mr Pienaar said he estimated Mr Bouwer had more than 300 cycads planted in his garden but would not say if he had a permit for these plants.

He said the latest seizure of illegal cycads — thought to be the single biggest haul in South Africa — could be related to an illegal cycad ring operating in the Eastern Cape/Ciskei area which was discovered earlier this year.

In that case 110 cycads were seized. Three illegal cycad rings have been discovered in the Ciskei so far this year.

In an earlier interview, Transvaal Nature Conservation Director Mr P F S Mulder said the illegal collection of cycads was 'assumed alarming proportions'.

Mr Pienaar said there had been a 'terrible outflow' of

cycads from the Eastern Cape/Ciskei area, resulting in some species almost being lost to the region.

The van Zyl Commission is currently investigating circumstances surrounding the export of more than 700 cycads from the Eastern Cape area — said to be worth more than R2 000 000 on international markets.

**THE CYCAD SOCIETY OF SOUTHERN AFRICA  
DIE BROODBOOMVERENIGING VAN SUIDELIKE AFRIKA**

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