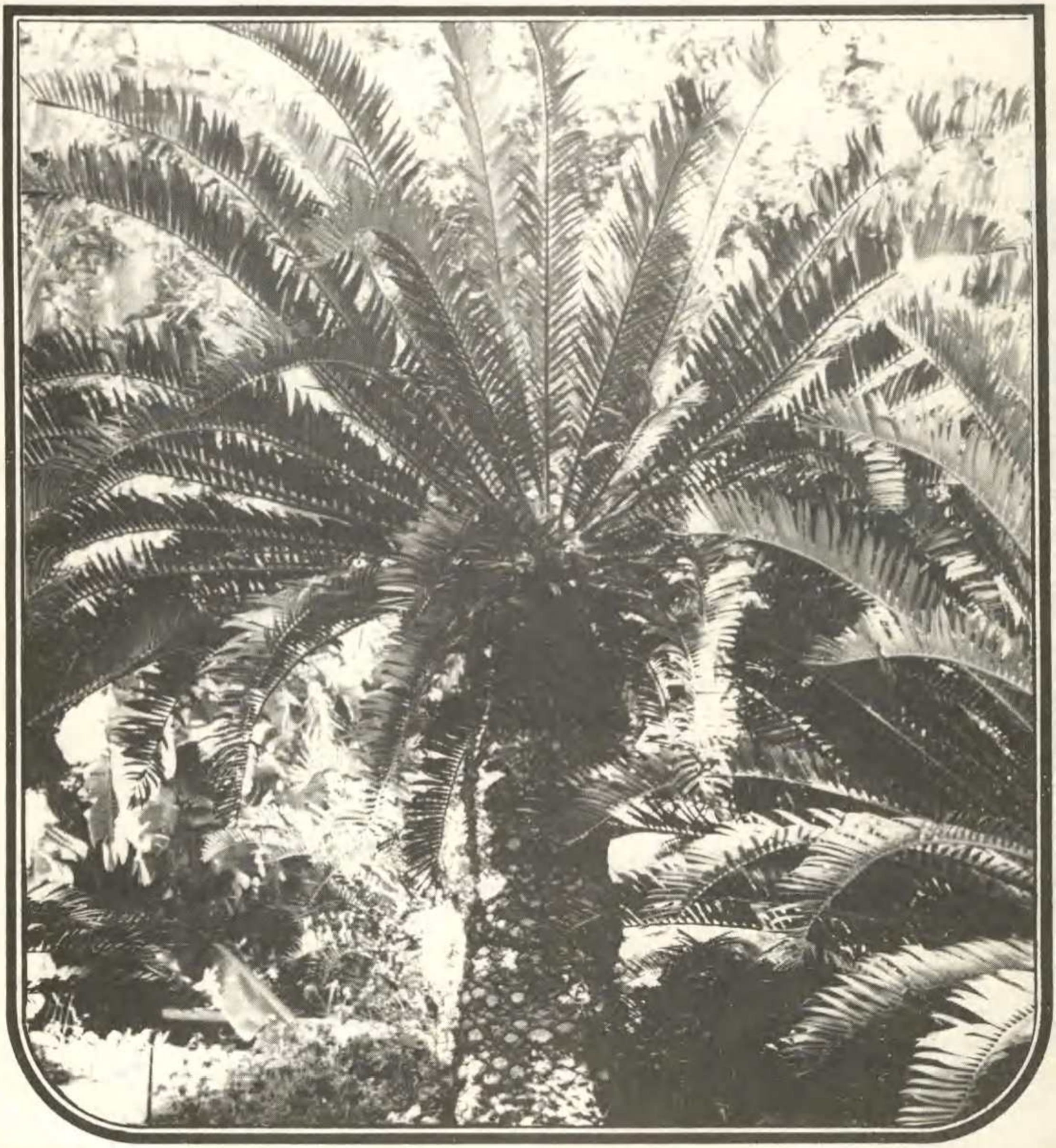
ENCEPHALARTOS

JOURNAL OF THE
CYCAD SOCIETY OF
SOUTHERN AFRICA

TYDSKRIF VAN DIE
BROODBOOMVERENIGING
VAN SUIDELIKE AFRIKA

NO. 13

MARCH / MAART 1988



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EDITOR/REDAKTEUR

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VOORBLAD/COVER

Encephalartos

altensteinii

EDITORIAL

After three years, ENCEPHALARTOS is now well established and a lot has been learnt from our experience. The time is probably opportune to present a brief summary of our editional policy. The under-mentioned are guidelines and not hard and fast rules, and are applied in a flexible manner.

- We try to provide for the interests of all groups of cycad lovers.
- Because the journal must be readable for all members, we avoid articles which are too technical. Where possible, extracts or summaries of such articles are made to make then accessible for the ordinary reader.
- Articles and other contributions are published in the language in which they are received.
- "Official" material, for example editorial comment, president's reports, seed bank news, etc. is as far as possible published in both English and Afrikaans.
- The "Focus On" article series is published in English to provide for the great overseas interest.

REDAKSIONEEL

Na drie jaar is ENCEPHALARTOS nou goed gevestig en is daar baie uit ons ondervinding geleer. Dit is waarskynlik 'n geleë tyd om ons algemene redaksionele beleid kortliks op te som. Die onderstaande is riglyne en nie vaste reëls nie, en word op 'n buigsame manier toegepas.

- Ons probeer voorsiening maak vir die belange van alle groepe broodboomliefhebbers.
- Omdat die tydskrif vir alle lede leesbaar moet wees, vermy ons artikels wat te tegnies is. Waar moontlik word uittreksels of opsommings van sulke artikels gemaak om hulle vir die gewone leser toeganklik te maak.
- Artikels en ander bydraes word geplaas in die taal waarin hulle ontvang word.
- "Amptelike" materiaal, byvoorbeeld redaksionele kommentaar, presidentsverslae, saadbanknuus, ens. word, waar moontlik, in beide Afrikaans en Engels gepubliseer.

EDITORIAL
- CONTINUED -

- Personal attacks on persons or institutions, or remarks which are offensive to persons or groups, are not published.
- The Editor (and the Society) does not accept responsibility for the content of articles, letters, etc. which are written by others.
- The Editor (and the Society) does not accept responsibility for any legal aspects concerning material which is advertised in the "Give and Take" and "Nursery News" columns.
- The Editor reserves the right to edit contributions received for publication as he deems necessary. Drastic changes will not be made without consultation with the contributor.
- We support and propagate the conservation of cycads in nature, inter alia through encouragement of the cultivation of cycads from seed.
- Constructive criticism, suggestions and comment are welcomed and proposals are put into practice, where possible.

Opinions which are expressed in the editorial are those of the Editor and do not necessarily represent the policy of the Cycad Society. Likewise are opinions expressed in articles published in ENCEPHALARTOS those of the authors and not necessarily those of the Cycad Society or the Editor.

REDAKSIONEEL
- VERVOLG -

- Die "Fokus Op"-artikelreeks word in Engels gepubliseer om vir die groot oorsese belangstelling voorsiening te maak.
- Persoonlike aanvalle op persone of instansies, of opmerkings wat persone of groepe te na kom, word nie gepubliseer nie.
- Die Redakteur (en die Vereniging), aanvaar nie verantwoordelikheid vir die inhoud van artikels, briewe, ens. wat deur ander persone geskryf word nie.
- Die Redakteur (en die Vereniging) aanvaar nie verantwoordelikheid vir enige wetlike aspekte ten opsigte van materiaal wat in die "Gee en Neem"- en "Nursery News"-kolomme geadverteer word nie.
- Die Redakteur behou die reg voor om bydraes wat vir publikasie ontvang word, na goeddunke te redigeer. Ingrypende veranderings sal nie gemaak word sonder om die bydraer te konsulteer nie.
- Ons ondersteun en propageer die bewaring van broodbome in die natuur, onder andere deur die aanmoediging van die kweek van broodbome van saad.
- Opbouende kritiek, wenke en kommentaar word verwelkom en voorstelle word, waar moontlik, toegepas.

Menings wat in die redaksionele artikel uitgespreek word, is dié van die Redakteur en verteenwoordig nie noodwendig die beleid van die Broodboomvereniging nie. Ingelyks is menings uitgespreek in artikels wat in ENCEPHALARTOS gepubliseer word, dié van die skrywers en nie noodwendig dié van die Broodboomvereniging of die Redakteur nie.

MEET YOUR NEW COMMITTEE

The new Executive Committee of the Society for the 1988/1989 term of office has now been finalised. The Committee is constituted as follows:

- Roy Osborne (President), directly elected by the members,
- Piet Vorster and Maans Kemp, directly elected by the members,
- Danie Nel, Frank Marx and John Burchmore, elected by their respective regional branches (at going to press we had not received information or who would represent the new Eugene Marais branch on the Committee),
- Cynthia Giddy, Roy Shooter and Pieter Stroebel, co-opted by the Committee.

Full particulars on the new Committee and portfolios appear on the inside back page.

Die nuwe Uitvoerende Komitee van die Vereniging vir die 1988/1989-ampstermyn is nou gefinaliseer. Die Komitee is as volg saamgestel.

- Roy Osborne (President), direk deur die lede verkies,
- Piet Vorster en Maans Kemp, direk deur die lede verkies,
- Danie Nel, Frank Marx en John Burchmore, deur hulle onderskeie streektakke verkies (teen druktyd het ons nog nie inligting gehad oor wie die nuwe Eugene Marais-tak op die Komitee sal verteenwoordig nie),
- Cynthia Giddy, Roy Shooter en Pieter Stroebel, deur die Komitee gekoöpteer.

Volledige besonderhede oor die nuwe Komitee en portefeuljes verskyn op die agter-binneblad.

Roy Osborne

- Born in Hornchurch, United Kingdom
- Family moved to South Africa when he was aged four
- Settled in Port Elizabeth
- Matriculated at Grey High School, Port Elizabeth
- Obtained B.Sc.(Honours) in Botany at Rhodes University, Grahamstown
- Worked in Zimbabwe
- Moved to Durban to start chemical consultancy firm
- Spent six months in New York
- Appointed to present post of lecturer in Chemistry at University of Natal, Durban
- Awarded M.Sc. degree for discovery of jessic acid, a chemical compound found in leaves of Combretum trees
- Married Angela Williams of Bulawayo. They have four children
- Cycad interests: enjoys growing cycads from seed
- Other interests: gardening and horticulture
- Initiated the Society in 1984 and bacame the first President
- Has visited U.S.A. and Europe and has lectured on cycads overseas

Maans Kemp

- Born at Humansdorp
- Matriculated at Nico Malan High School, Humansdorp
- Obtained B.Sc. degree and teachers diploma at Stellenbosch University
- Taught at Jansenville High School and Muir College, Uitenhage from 1970 to 1980
- Obtained B.Sc.(Honours) degree in Geography through UNISA
- Appointed Public Relations Officer for Port Elizabeth Technikon in 1980
- Currently Head of Department, Student Activities at P.E. Technikon
- Obtained Public Relations Diploma at P.E. Technikon
- Married Petro Sauerman. They have two sons
- Cycad interests: collecting on small scale, cultivating from seed, reading and writing about them, seeing and photographing them in nature
- Other interests: genealogy (published a family history of his side of the Kemp family in 1986, stamp collecting, woodwork, reading, travelling

Piet Vorster

- Born in Pretoria
- Matriculated at Afrikaans Boys' High School, Pretoria
- Obtained M.Sc. degree in Agriculture and D.Sc. degree in Botany at University of Pretoria
- Worked at Botanical Research Institute in Pretoria form 1969
- Appointed Research Officer in Department of Botany, Stellenbosch University in 1979
- Has been doing research on Pelargonium; joint author of book on the genus
- Married Elsa Brits. They have one son
- Cycad interests: interested in cycads for past 20 years; has collection of approximately 120 species from all over the world, many cultivated from seed by himself; interested in taxonomy and hibridisation of cycads
- Other interests: Palms

John Burchmore

Frank Marx

- Born in Port Elizabeth
- Matriculated at Lawson Brown High School, Port Elizabeth
- Worked for BSB (Farmers' Co-operative)
- Joined SA Railways in 1944
- Obtained B.Admin degree through UNISA
- Spent 1968 to 1970 at Transport Services head office in Johannesburg
- Returned to Port Elizabeth and became Superintendent (Personnel) in Cape Midlands regional office
- Retired in 1987
- Married Elsa Scheepers. They have one son
- Cycad interests: collecting (especially Eastern Cape species)
- Other interests: stamp collecting, antiques, gardening

Danie Nel

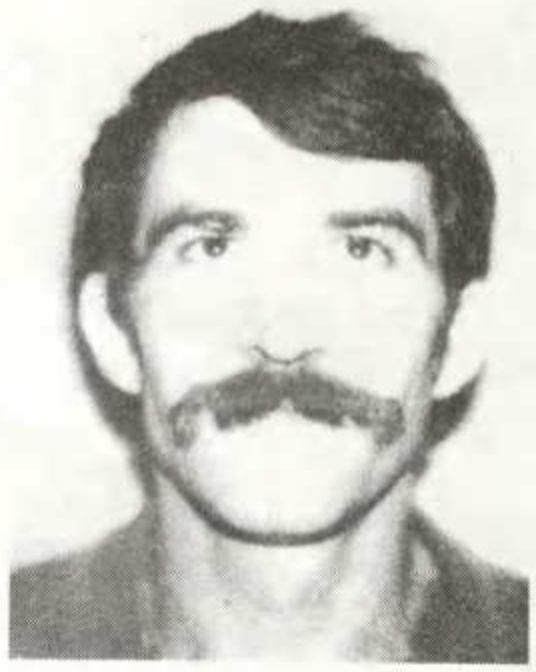
- Born at Cradock
- Completed school career at Cradock
- Joined South African Railways Police
- Accepted post in Durban after completing his training
- He is married and has three children
- Other interests: collects coins, bank notes and first day covers
- Became Society's first Seed Bank Officer

Cynthia Giddy

- Born at Cradock
- Matriculated at Jan van Riebeeck High School, Cape Town
- Obtained B.A. (Honours) degree in Psychology at Rhodes University, Grahamstown
- Started aloe and later cycad nursery at Umlaas Road in 1969.
- Published a book, "Cycads of South Africa", in 1974. Revised edition appeared in 1985
- Has visited USA, Australia and other countries and has lectured on cycads, inter alia in the USA, France and at Kew, England
- Married Ted Giddy. They have four daughters
- Cycad interests: cultivating from seed
- Other interests: photography, genealogy, building of miniature dolls' houses

Roy Shooter

- Born in Transvaal
- Product of Capricorn High School, Pietersburg
- An electrician by trade
- Married to Charmaine. They have two daughters
- Cycad interest: collecting
- Other interests: gardening, deep sea fishing



Pieter Stroebel

- Grew up in Port Elizabeth
- Matriculated at Cillié High School, Port Elizabeth
- Obtained B.Comm. degree at University of Port Elizabeth
- Obtained entrance qualification for Institute of Municipal Treasurers and Accountants through University of South Africa
- Has worked at South African Transport Services, a petrol company and since 1975 at Port Elizabeth Municipality. Currently holds position of Financial Officer.
- Married Marie Grobler. They have a son and a daughter.
- Cycad interests: collecting, cultivating cycads from seed
- Other interests: gardening, do-it-yourself tasks

FOCUS ON... FOKUS OP...

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

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

ENCEPHALARTOS ALTENSTEINII

by Maans Kemp

INTRODUCTION

Encephalartos altensteinii, one of the taller-growing South African cycad species, always makes a very attractive display; in its natural habitat or in cultivation. Its availability, the ease with which it is grown and its relatively fast growth-rate make it an excellent garden plant. Its long, fresh-green leaves will create a lush effect in any garden.

DISCOVERY AND NAME

The species was first described and named in 1834 by Professor Johann Georg Christian Lehmann, a former director of the Botanic Gardens at Hamburg, in the publication "Novarum et Minus Cognitarum Stirpium Pugillus Sextus". Lehmann named the species after Altenstein, a German chancellor of the nineteenth century. He based his description on material obtained from Christian Friederich Ecklon and Karl Ludwig Zeyher, who had collected it in "the country of the 1820 Settlers". It is possible that these two had sent live plants to the Hamburg Gardens and that Lehmann had based his description on these.

Ecklon arrived at the Cape of Good Hope as a professional collector in 1823. In 1830 he published possibly the first botanical paper ever published in South Africa: "A list of plants found in the district of Uitenhage between the month of July 1829 and February 1830". Zeyher, also a professional collector, arrived at the Cape in 1822 and stayed intermittently for approximately 25 years. Ecklon and Zeyher worked together for a few years and jointly published the "Enumeratio plantarum Africae Australis (1835-1837)".

In a letter from Zeyher, quoted by Hooker in the "Botanical Magazine", it is stated that " E. altensteinii is found in woods on the Boschman's River ...". Professor Rudolf Marloth, writing in 1913, refers to specimens received from "Kaffraria". In time, cycads rather similar to the Eastern Cape E. altensteinii were discovered in Natal and the Eastern Transvaal, and all or some of these were accepted as belonging to the same species by writers such as Pearson (1916), Chamberlain (1919 and 1934), Hutchinson and Rattray (1933) and Henderson (1945).

When Medley Wood discovered the species now named after him, he referred to it as E. altensteinii var. bispinosa (1907). It was described as a separate species and named E. woodii by Sander in 1908, however.

In 1926 Stapf and Burtt Davy described the Eastern Transvaal plants as a separate species, which they called E. transvenosus. Henderson (1945) and later writers reaffirmed this separation. In 1949 Dr Inez Verdoorn separated the species E. lebomboensis from E. altensteinii, and in 1951 Drs R.A. Dyer and I. Verdoorn separated E. natalensis from E. altensteinii.

Lehmann's illustration of E. altensteinii in 1834

Lehmann's illustration of an E. altensteinii leaf in 1834

DISTRIBUTION

The distribution area of E. altensteinii, as it is now defined, stretches from the banks of the Bushmans River in the district of Alexandria north-eastwards through the districts of King William's Town and East London, and through the Transkei to near the Natal border. It is associated with low coastal bush and forest, but also occurs on exposed cliffs and rocky hillsides. Some plants grow under the cover of fairly high forest. The annual rainfall in its distribution area ranges from 875 to 1000 mm and occurs mainly in summer. Temperatures range from an average of 15 to 17 degrees C in winter to a average of 20 to 25 degrees C in summer. Frost does not normally occur.

E. altensteinii in a forest habitat (photograph: Roy Osborne)

A collection of E. altensteinii specimens with unusual shapes

DESCRIPTION

1. STEM

E. altensteinii grows quite tall, with stems up to 4 or 5 m long. Plants growing in deep shade or with reclining stems may reach a stem length of 7 m. Reclining stems sometimes come to lie flat on the ground and may be twisted into unusual shapes. The diameter of the stem is usually 25 to 35 cm. Plants growing in the shade tend to have taller, thinner stems than those growing in exposed localities. A small amount of wool may sometimes be present on the top of the stem. The stem is usually unbranched but may sometimes be branched. Suckering at the base may occur and clumps of stems growing from the same original rootstock can sometimes be seen.

2. LEAVES

The leaves are 1 to 2 m long and in rare cases up to 4 m. The rachis is nearly straight in exposed conditions but may be recurved in the shade. In young leaves the rachis is hairy, but the hairs soon fall off. The petiole is 10 to 30 cm long.

Plate 15.

A: Encephalartos Altensteinii *Lehm.* B: E. villosus *Lehm.*

Marloth's illustration of E. altensteinii (and E. villosus) in 1913

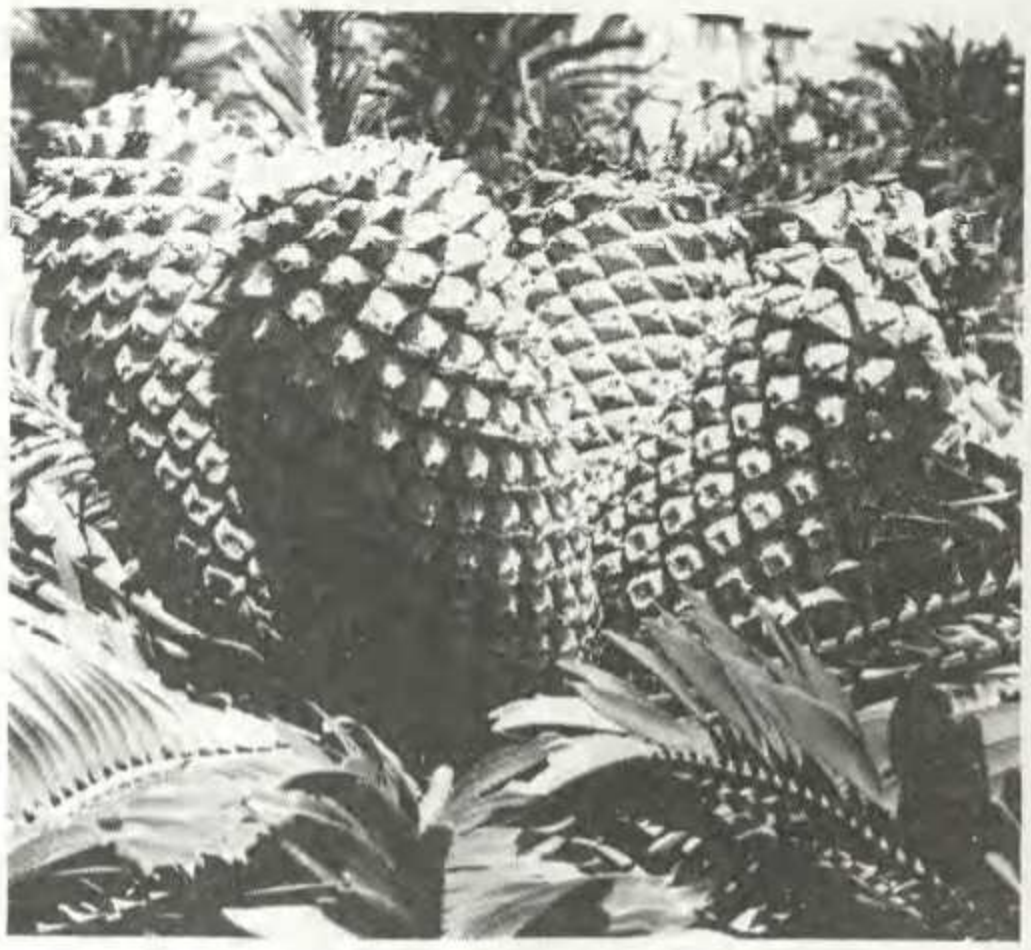
The leaflets at the middle of the leaf are 15 cm long. and 2,5 cm broad and have a fresh-green or yellow-green colour. Young leaves are usually lighter in colour than older leaves. The leaflets may have smooth edges or may have one to three (sometimes up to five) teeth on either or both margins. Younger plants are more toothed than older ones. Leaflets of basal suckers tend to be broader than those of the mother plant. The leaflets are reduced in size towards the base of the leaf, but are not reduced to a series of prickles. The lower 15 to 20 cm of the leafstalk is bare. The leaflets are attached to the rachis in such a way that they form an open "V". The leaflets overlap, especially towards the tip of the leaf.

3. CONES

Male and female plants usually bear from two to five golden-yellow or yellowish-green cones. The cones are borne on short, stout peduncles.

Male cones are subcylindric in shape and rounded or narrowed towards the tip. They are 40 to 50 cm long and 12 cm in diameter. The cone scales at the middle of the cone are up to 5 cm long and 3 cm broad. The face of the scale forms a decurved beak, about 1,5 cm long.

The female cones are roughly egg-shaped, 40 to 55 cm long and 20 to 30 cm in diameter. The cone scales at the middle of the cone are 7 to 8 cm long,

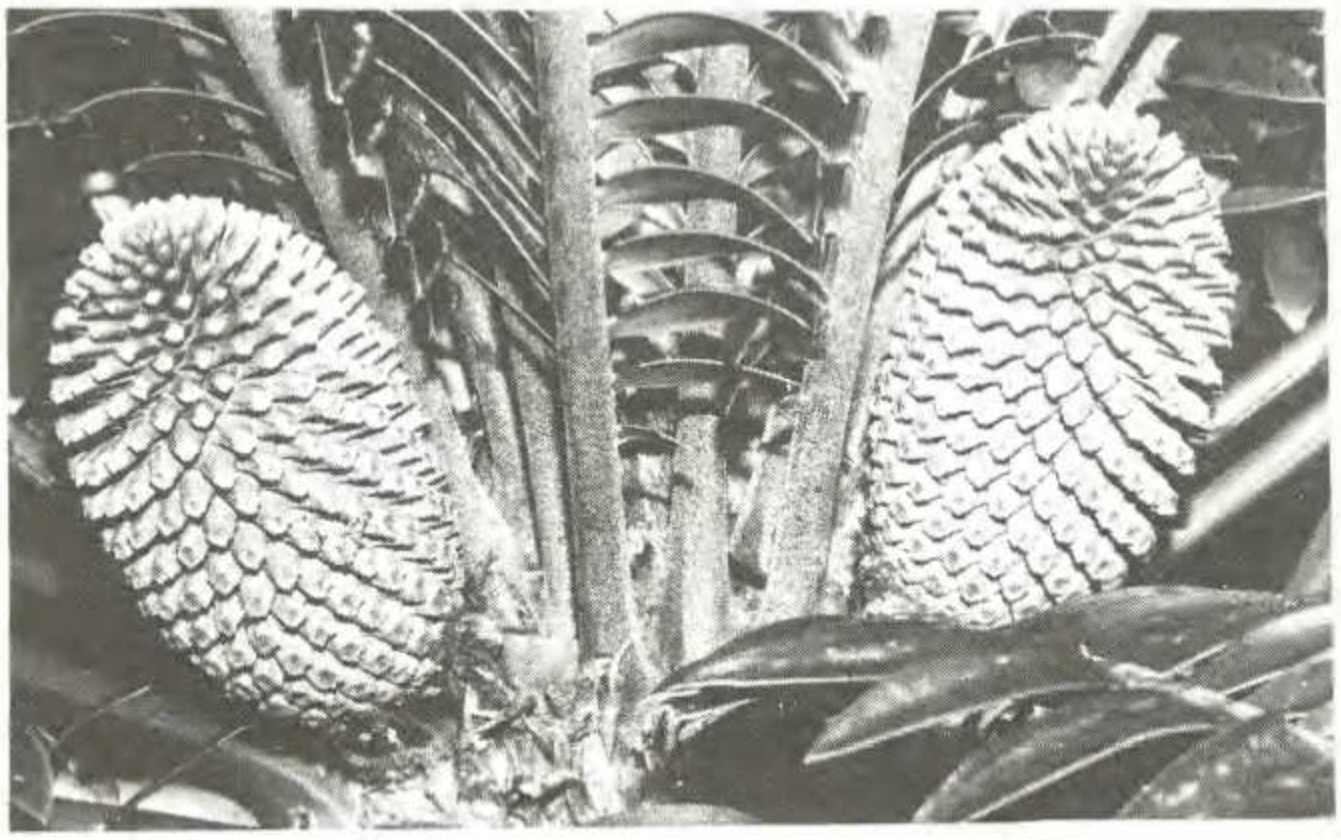


Female cones of E. altensteinii

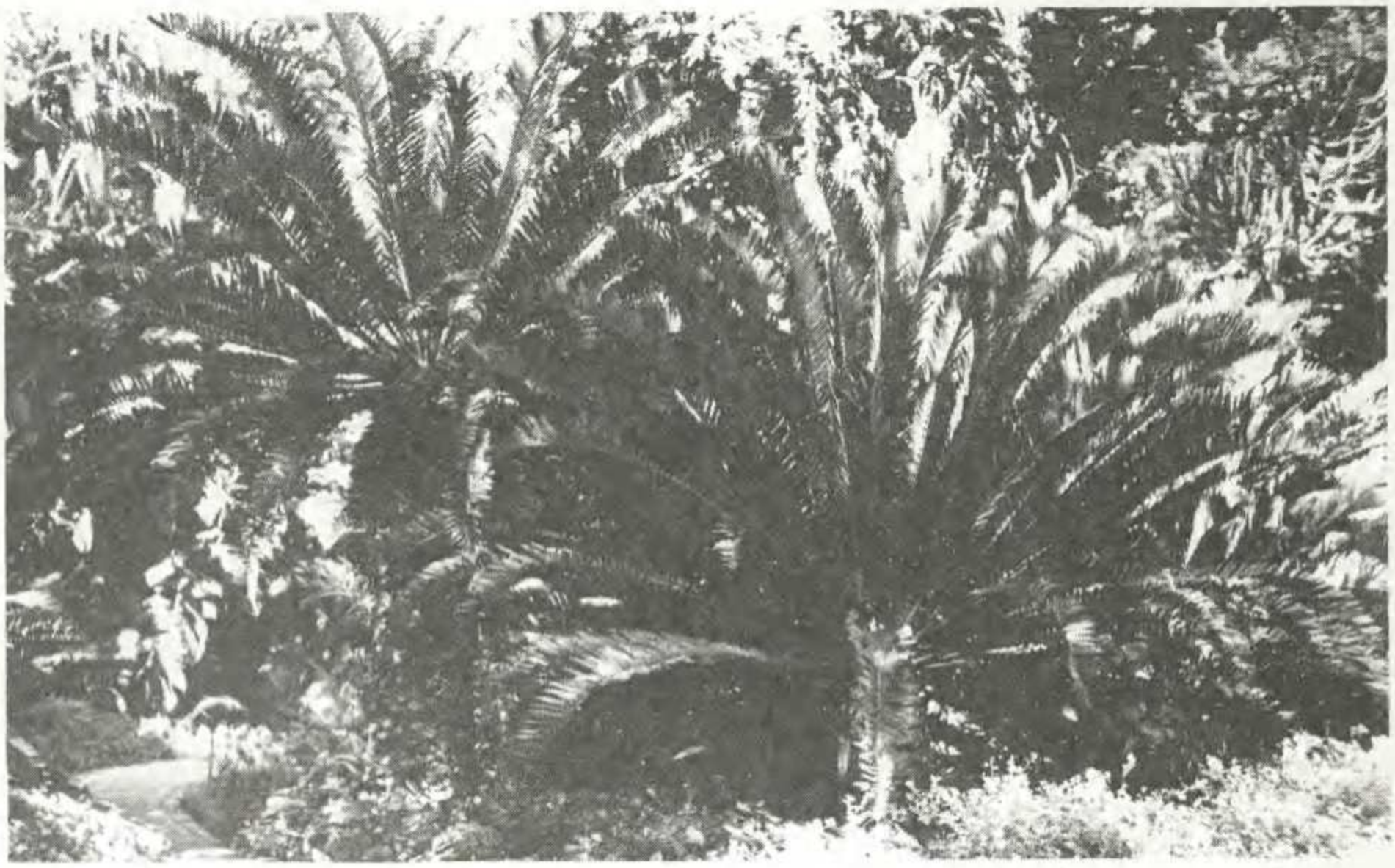
8 to 9 cm broad and 4 cm thick. The face of the scale is deeply wrinkled and lumpy and carries some hair. The seeds are scarlet or bright shiny red in colour and approximately 4 cm long and 2,5 cm in diameter.

AFFINITIES

E. altensteinii is most closely related to E. natalensis, but also probably to E. lebomboensis, E. transvenosus, E. woodii, E. longifolius and possibly E. paucidentatus. There are authoritative persons who regard E. altensteinii, E. natalensis (with its many variations) and E. lebomboensis (with its variations) as geographical varieties of the same species.



Male cones of E. altensteinii



Healthy specimens of E. altensteinii in a public garden

E. altensteinii may be distinguished from E. natalensis by means of the following differences:

- E. altensteinii does not have the series of pricles at the base of the leafstalk which occurs in E. natalensis.
- E. altensteinii may produce some hair before new leaves or cones are formed, but not as much as is formed in E. natalensis.
- E. altensteinii occurs south of the Natal border while E. natalensis occurs in Natal.

E. altensteinii may be distinguished from E. longifolius as follows:

- The leaves of E. altensteinii are yellowish-green in colour while those of E. longifolius are darker green or blueish green.
- The leaflets of E. altensteinii overlap less than those of E. longifolius.
- The leafstalk of E. altensteinii is almost straight while that of E. longifolius is gracefully curved.
- The cones of E. altensteinii are golden-yellow and wrinkled (in the female) while those of E. longifolius are smooth and dark olive-green in colour.
- The stem of E. altensteinii tends to be lighter in colour than that of E. longifolius, with large, prominent old leaf-scars.
- E. altensteinii is found mainly in the coastal bush north-east of the Bushmans River while E. longifolius is mainly an inland species, associated with Table Mountain Sandstone, which occurs westward from Grahamstown.

E. altensteinii can be distinguished from E. lebomboensis by the following:

- E. altensteinii has no prickles at the base of the leaf while E. lebomboensis is usually densely-prickled.
- The leaflets of E. altensteinii are longer and broader than those of E. lebomboensis.
- The distribution areas of the two species are far apart.

No problems should be experienced in distinguishing E. altensteinii from E. transvenosus, E. woodii and E. paucidentatus respectively. Apart from their geographical separation, these species are sufficiently different in leaf and cone characters to be distinguished at first glance.

HYBRIDIZATION

Of all the South African species, E. altensteinii seems to be the one most involved in natural hybridization. Four other species occur within the distribution range of E. altensteinii.

E. altensteinii grows together with E. trispinosus in some localities and a bewildering variety of probable hybrids can seen. Some plants suggest that second generation hybridization has occured. A variety of character combinations is found concerning leaf colour, leaflet shape and spacing, and cone characteristics. One result of this hybridization process is that E. trispinosus is a very difficult species to define.

E. altensteinii also shares its distribution area with E. villosus and hybrids between these two species have been recorded. The hybrids are almost completely intermediate between the parents as far as leaf and cone characteristics are concerned. The presence of prickles on the petiole of a plant that resembles E. altensteinii may also suggest this hybridization.

Hybrids between E. altensteinii and E. latifrons and E. arenarius respectively have been recorded. The hybrids generally have characters intermediate between the parent species.

CONSERVATION

E. altensteinii does not appear to be faced with extinction in its natural habitat at the moment. Like all other cycad species, it is under pressure because of bush clearance and illegal collection, however. In South Africa and Transkei it occurs in areas protected by some or other nature conservation authority and its survival seems relatively assured in these areas.

The thousands of mature plants in public and private gardens do however indicate that the species is no longer as numerous in nature as in the days when they were described as "abundant" by Prof. C.J. Chamberlain during his visit in 1912. Like all our cycads, E. altensteinii needs to be protected in nature.

Clump of E. altensteinii in Cape Town Gardens

CULTIVATION

E. altensteinii has been cultivated widely in public and private gardens around the world. Prof C.J. Chamberlain (1919) writes that it is "one of the most popular cycads in botanical gardens throughout the British colonies...". Prof. H.H.W. Pearson writes in 1916: "This familiar species is very common in Cape Gardens". When the Kirstenbosch Botanic Garden, the first in South Africa, was established early this century, E. altensteinii specimens probably formed the bulk of the new cycad collection. These plants can still be seen at Kirstenbosch. Today they are magnificent specimens, some of which even welcome the visitor outside the gates.

Another famous group of E. altensteinii plants graces Lukin Road in East London where a long row of tall plants have been planted along the middle island of the road. Similar avenues of plants can be seen in Grahamstown and Port Alfred.

The avenue of E. altensteinii specimens in Lukin Road, East London

E. altensteinii is a resilient plant, with great vitality. Prof. R. Marloth writes in 1913: "The vitality of the plants is astonishing. Trunks of Encephalartos altensteinii, which had been kept lying in a shed for four years,... on being planted, produced new leaves the next summer."

E. altensteinii grows well in cultivation. It may be grown in full sun, half shade or even in the shade. In inland areas, protection against frost may be necessary. Plants will do well in well-drained soil, rich in humus. Sufficient water will help to produce luxurious growth. Leaves and cones are produced regularly, sometimes appearing at the same time.

The species is easily cultivated from seed and seedlings are freely available. Seedlings grow fast and five-year old plants can be used very effectively in the garden. Plants also do very well in containers and can make all the difference to a patio or pool area.

BIBLIOGRAPHY

CHAMBERLAIN, C.J. 1919. The Living Cycads. Univ. Chicago Press.

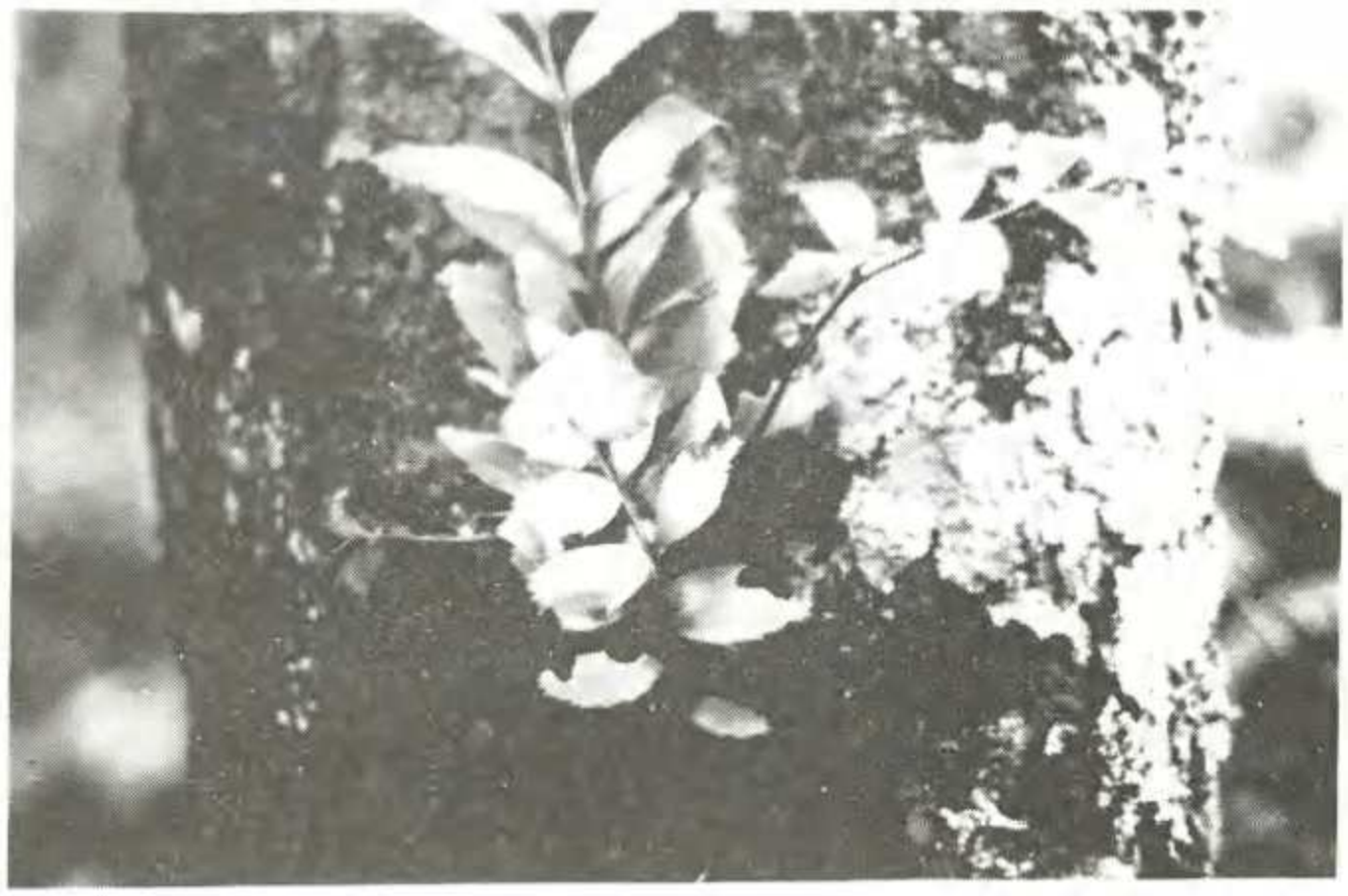
CHAMBERLAIN, C.J. 1934. Gymnosperms - Structure and Evolution. Univ. Chicago Press. Reprint Johnson Reprint Corporation.

DYER, R.A. (Ed.). 1949. Encephalartos lebomboensis. The flowering plants of Africa 27.

DYER, R.A. 1955. A new cycad from the Cape Province. Journal of South African Botany 22: 1-4.

DYER,R.A. 1965. New species and notes on type specimens of South African Encephalartos. Journal of South African Botany 31: 111-121.

DYER, R.A. The Cycads of Southern Africa. Bothalia 8 part 4.



An E. altensteinii seedling which germinated in a crack in a tree trunk
(photograph: Roy Osborne)

E. altensteinii specimen in a container

DYER, R.A. and I.C. Verdoorn. 1951. Encephalartos natalensis. Bothalia 6 part 1: 205-211.

DYER, R.A. and I.C. Verdoorn. 1966. Zamiaceae. Flora of Southern Africa 1: 1-34.

GIDDY, C. 1974. Cycads of South Africa, Purnell.

HENDERSON, M.R. 1945. Materials for a revision of the South African species of Encephalartos. The Journal of South African Botany 11.

HUTCHINSON, J. and G. RATTRAY. 1933. Cycadaceae. Flora Capensis 5 section 2:24-44.

JESSOP, J.P. 1963. Some botanists and botanical collectors associated with South Africa. Lantern 13 no. 1:80-85.

LEHMANN, J.G.C. 1834. Novarum et Minus Cognitamm Stirpium Pugillus Sextus.

MARLOTH, R. 1913. Guymnospermae. The Flora of South Africa 1:89-101.

PALMER, E. and N. PITMAN. 1972. Trees of Southern Africa.

PEARSON, H.H.W. 1916. The Kirstenbosch Cycads. The Journal of the Botanical Society, part 2:7-13.

RATTRAY, G. 1913. Notes on the pollination of some South African Cycads. Transactions of the Royal Society of South Africa 3:259-270.

VORSTER, P. 1987. Hybridization in Encephalartos. Encephalartos 10:10-15.

E. ALTENSTEINII.

E. *caudice glabro, rhachi subcylindrica pinnisque lanceolatis acutis glabris nitidis spinoso - mucronatis dentibus utrinque 3 - 5 spinosis distantibus divaricatis.*

Eximiae hujus speciei caudex, erectus et cylindricus. pariter assurgit in altitudinem quatuor vel quinque pedum. diameter est unius pedis vel unius cum dodrante. Maxime autem distinguitur caudex hujus speciei ab illa, quam supra descripsimus, eo quod non lanuginoso tomento obducta. sed nuda apparet, sicut caudices plurium aliarumque specierum. quarum in numero sunt E. *horridus*. *caffer*. *longifolius* etc. Frondium vero discrimen reperitur nullum, neque ratione

First part of Lehmann's description of E. altensteinii in 1834

2 *

KEËLBLARE IN TRANSVENOSUS

deur Willie Pretorius

Onlangs het een van my vriende in wie se tuin 'n plant van Encephalartos transvenosus groei, my vertel dat sy vroulike plant drie keëls het wat al drie blare bo-op die keëls gevorm het. Ek was verbaas want ek het al voorheen van so iets gehoor maar dit nog nie self gesien nie. Ek was baie beïndruk toe ek die plant sien. Ek het 'n foto geneem en een keël van hom gekry wat ek van nader wou bekyk.

Ek het 'n paar skubbe onder die blare verwyder, soos u op die foto sal sien en het tot die besef gekom van wat plaasgevind het.

Female cones of E. transvenosus with leaves

A cone with a few scales removed below the leaves

As 'n mens na 'n keël van Encephalartos kyk, sien 'n mens dat die keël se boonste gedeelte (ongeveer 1/6 van die lengte) se skubbe heeltemal verskil van die res. Dit is op die oog af duidelik dat dit nie vrugdraende skubbe is nie. Hulle eindpunte is langer, platter en kleiner as die normale. Binne het hulle ook nie die vorm van die normale saaddraende skub nie. Die skouers waaronder die saad geheg is, het in die geval van die afwykende skubbe, plat verlengde groeisels wat byna lyk soos die vlerke van 'n voël. Die groeisels van die skubbe nader na die bopunt van die keël word korter, sodat dit later soos die gewone basis van die blaar lyk.

In die voorbeelde wat ek bekyk het, het hierdie dowwe skubbe met die langer eindpunte ontwikkel en langer gegroei. Die onderstes het kort droë blaartjies gevorm. 'n Bietjie hoër op is hulle steeds baie kort maar is nou lewende blare en op die punt is daar 'n aantal normale blare van ongeveer 45 cm lank.

Ek het al die skubbe van die sentrale as verwyder en die wonde met hormoonpoeier en boomseël behandel en dit in die opelug in die skadu geplaas om goed te genees en af te droog. Dan wil ek dit in effe klam sand plant.

Ek kan net nie toelaat of toesien dat so'n keël wat homself soos 'n plant gedra, sommer weggegooi kan word nie. As dit wel vrek, soos ek in stilte maar vrees, sal ek myself nogtans troos dat ek tot die einde toe by hom gestaan het en sal ek my nie kan verwyt dat ek nie probeer het nie!

Ek sal maar vir die televisie se uil en trapsuutjies vra om vir ons die uitslag van my poging oor die "Nuustak" bekend te stel (as die plant groei)!

(Willie Pretorius se adres: Posbus 338, Tzaneen, 0850)

The cone axis with all scales removed

REGIONAL NEWS STREEKNUUS

Natal

Members of the Natal branch admiring a tall cycad during a visit to the Old Fort Road Gardens on 6 December 1987.

The members also visited the Durban Botanic Gardens and the house of John Medley Wood, the first curator of the Natal Herbarium. The building now houses offices, as well as a unique museum which contains botanical articles, photographs and historical items.

Noordoos-Transvaal / North-Eastern Transvaal

LOREN BRONKHORST DOEN VERSLAG OOR 1987:

Vroeg in 1987 is daar besoek afgelê by twee privaattuine in die Hoedspruitomgewing. Vir die lede teenwoordig was dit 'n voorreg om sulke groot versamelings, asook sulke goed-gevestigde plante te besigtig. Daarna het lede die naby-geleë slangpark besoek.

Vir Maartmaand is daar 'n uitstappie gereël na die voetslaanpad in die Loskopdamomgewing. Dit is jammer dat die opkoms swak was, aangesien dit ons eerste besoek na broodbome in hul natuurlike habitat was. Nogtans het die paar lede wat daar was dit die moeite werd gevind.

Meer onlangs is twee privaat-broodboomversamelings in die Tzaneenomgewing besoek. Ons streek se jaarvergadering is op dieselfde dag (3 Oktober) gehou. Tydens die vergadering is die volgende nuwe komitee vir 1988 verkies: Voorsitter - John Burchmore, Sekretaresse - Loren Bronkhorst en Addisionele Lede - Frans Wessels, André Topham en Marion Debruyne. Die vergadering is afgesluit met 'n baie interessante skyfievertoning oor broodbome, aangebied deur mnr. Charles de Kock.

The new North-Eastern Transvaal committee. From left to right: Frans Wessels, Marion Debruyne, André Topham, Loren Bronkhorst and John Burchmore

Eugene Marais

'n Nuwe tak van die Vereniging is op 30 Januarie 1988 gestig vir lede in die Pretoria-Johannesburg-gebied. Die tak sal as die Eugene Marais-tak bekend staan. Mnr. S.J. Schoeman is as voorsitter verkies, met prof. Nat Grobbelaar as ondervoorsitter, Ben Visser as Sekretaris/Tesourier en Ita van der Walt en Neil Munro as addisionele lede.

Members of the Society who live in the Johannesburg-Pretoria region may apply in writing to join the new branch. A branch membership fee of R10,00 per year is payable. Persons who are interested in joining this new branch may contact Ben Visser (31 Troupand Street, Brits, 0250; tel. no. 01211-20151 (work), 22928 (home)).

Oos-Kaap / Eastern Cape

Die laaste byeenkoms van die streek vir die jaar het op 14 Desember 1987 plaasgevind. Die streek was geëerd om besoek te ontvang van die President van die Vereniging, Roy Osborne. Roy het die teenwoordiges toegespreek oor "Cycads: Past, Present and Future". Nadat almal gesellig saam tee gedrink het, het Roy 'n kleurskyfiereeks "Cycads around the World" vertoon. Al die lede was dit eens dat die byeenkoms baie interessant en geslaagd was.

CYCAD SUCKER SUCCESS

by Bruce Bursey

I read with interest the reference in ENCEPHALARTOS no. 12 page 8 ("Lewe en Dood") to the formation of suckers in cycads as a result of damage to the plant. This happens frequently to garden cycads even without assistance from factors such as frost, hail or drought. Perhaps Dr Claassen and other readers may be interested in my way of dealing with this type of "sucker".

When I see these leaves forming on the stem, I leave them for a year or two until such time as their base starts forming a caudex. Then I cut off all the leaves and leave it to make new leaves. As soon as these have hardened, I cut them off again. Somehow or other this seems to promote growth in the newly-forming caudex. Eventually, after a few years, it will almost isolate itself and will start making a few roots at its base. This is then the time to remove the new young caudex.

Never break any sucker or aerial sucker off a cycad. This is asking for immediate problems. The break is never regular and fungus infection will set in almost immediately. The aerial suckers must be cut off with a sharp knife, as neatly as possible - a large butcher's knife is ideal for this job. Even after this a certain amount of trimming would be necessary to get the cut as even as possible.

The cut should then be treated with a suitable fungicide, preferably Daconil. Normally I then put the bulbs into a strong insecticide and fungicide solution and allow them to soak for up to two hours. After this, store them in a dry shady place for two to three weeks and then plant them. Following this procedure will give at least a 90% success rate at re-rooting the young caudexes. Using a rooting bench will give an even higher success rate.

With basal suckers, the same rules should also apply. One must dig deep enough to expose the whole sucker. A high pressure water hose should then be used to flush out all the soil between the sucker and parent plant. This soil tends to make the sucker extremely difficult to remove. Here again a large knife should be used to cut off the sucker. Never use an axe, crowbar, tommybar, etc. to remove suckers. These implements always damage the suckers and one has a lower success rate in re-establishing them. Most of those that do re-establish successfully are partially eaten up by rot and take so much longer to grow into decent specimens.

Another implement I find useful for taking off the larger suckers is a leaf spring from an old truck. The wider and thinner the spring the better. Cut off a 45 cm (18 inch) section of the spring and sharpen the one end - the sharper the better. This can then be used as a chisel and tapped through carefully between the mother plant and the sucker. All the soil should again be flushed away by means of a water hose before removing.

The same treatment as for the aerial suckers whould then be applied. The importance of soaking thse suckers cannot be stressed enough. Another important factor, in my opinion, is the removal of all leaves when a sucker is removed. With the dehydration of the caudex after removal, there is bound to be a certain amount of loosening around the leaf bases and this is where fungus gets in.

Perhaps the time has come for research to be done in propagating suckers. With all the plants in cultivation forming suckers, this is becoming an important source of supply for collectors. It then becomes a tragedy when one sees potentially beautiful plants badly bandled and lost to those interested in them.

(Bruce Bursey's address: P.O. Box 9, Kei Road 4920)

EXUDATES FROM ENCEPHALARTOS CONES

by Daphne C. Stephens and Alistair M. Stephen

REVIEWED BY ROY OSBORNE

From casual observation of plants in the field or in gardens, many readers will have noticed the soft, jelly-like exudate which appears following damage to cycad stems, leaf stalks, cones and other parts. This exudate serves as a protective sealing layer over the damaged site and eventually dries to a hard, brittle lump. Similar gummy deposits are also seen after heavy rains, when they may be produced to counteract osmotic changes within the plant. In some plants these exudates are commercially important; gum arabic (from Acacia species), gum karaya (from Sterculia species) and gum ghatti (from Anogeissus species) are examples.[1]

In chemical terms, these exudates comprise plant sugar units which are linked one to another in large, complex carbohydrate molecules. The nature of the individual sugar units and the manner in which they are linked together in the polysaccharide structure are often characteristic of the taxonomic position of the plant concerned. Thus the analysis of these substances can often provide useful data when the taxonomic ranking and the phylogenetic position of a plant is in doubt.

The molecular structures are determined by chemical and spectroscopic techniques. Only milligram quantities are needed to identify the sugar units, up to one gram is required to find out the actual amounts and the modes of linkage of the sugars, while somewhat larger quantities are used in the more difficult task of predicting the sequence in which the units join to form the polysaccharide structure. The samples are processed through a complex series of steps which involve sonic vibration, filtration, freeze-drying, base-precipitation, redissolving and reprecipitating. Further purification requires passage through suitable chromatographic columns. Step-wise or total acid hydrolysis breaks down the macro-structure to produce sugar units and sugar acids, which are analysed by techniques such as gas-liquid chromatography, optical rotation measurements, nuclear magnetic resonance spectroscopy and mass fragmentation patterns. A range of chemical processes are required to prepare the polysaccharides for examination in this way.

Preliminary results have shown that the Encephalartos gums from several species are remarkably similar in chemical structure, and are of a type not often encountered elsewhere.[2] Three structural features are unusual. One is the occurrence, in varying amounts, of the sugar unit 3-O-methyl-L-rhamnose (a compound also found in gum from Welwitschia.[3] Another is the relatively high concentration of this sugar when taken together with the closely-related L-rhamnopyranose unit; the total often comprising more than 20% of the gross carbohydrate composition. Finally, there is a high proportion of acidic units, notably D-glucuronic acid and its related 4-methyl ether. Some of the acid is linked to D-mannose, forming what is considered to be the core structure to which chains of D-galactose are joined.[4]

Table 1 shows a comparison of the sugars found on hydrolysis of the exudates from cones of three species of Encephalartos. Details of the data collected in other, including methylation, analyses are too lengthy to present in this article, but a synthesis of the information leads to the proposal for an arrangement of the monosaccharide units in a composite structure such as represented in Figure 1. The small numbers show the positions of inter-sugar linkage that have been established, but many variations of the whole structure are possible.

TABLE 1

PROPORTIONS OF SUGARS FOUND ON ACID HYDROLYSIS OF

E FRIDERICI-GUILIELMI, E GHELLINCKII AND E LONGIFOLIUS

SPECIES	Me 3 ◇	◇	▽	△	◇	□	◎
E friderici-guilielmi	1	26	7	1	4	33	26
E ghellinckii	11	20	6	1	3	32	27
E longifolius	2	16	10	2	8	31	30

Analyses based on glc of AA (alditol acetate) and PAAN (peracetylated aldononitrile) derivatives from hydrolysates of the gums from three *Encephalartos* species.

Legend :

Me 3 ◇ 3-O-methyl-L-rhamnose

◇ L-rhamnose

▽ L-arabinose

△ D-xylose

◇ D-mannose

□ D-galactose

◎ D-glucuronic acid

This work, which is supported jointly by the Foundation for Research Development of the CSIR, and by the University of Cape Town, continues, and it is hoped that a more extensive survey of the genus Encephalartos will eventually be completed.

REFERENCES

1. A.M. Stephen in 'The Polysaccharides' (G.O. Aspinall, ed.), Vol 2, Academic Press, New York, 1983, p 97.

2. D.C. Stephens and A.M. Stephen, Abstr. Papers, 75th S.A. Chem. Inst. Convention, Durban, July 1987. p 105. The species referred to as E. cycadifolius has since been established as E. friderici-guilielmi.

3. M. Kaplan, A.M. Stephen and D. Vogt, 'S.A. Med. J.', 1966, 40, p 702.

4. A.M. Stephen and D.C. de Bruyn, 'Carbohydr. Res.', 1967, 5, p 256.

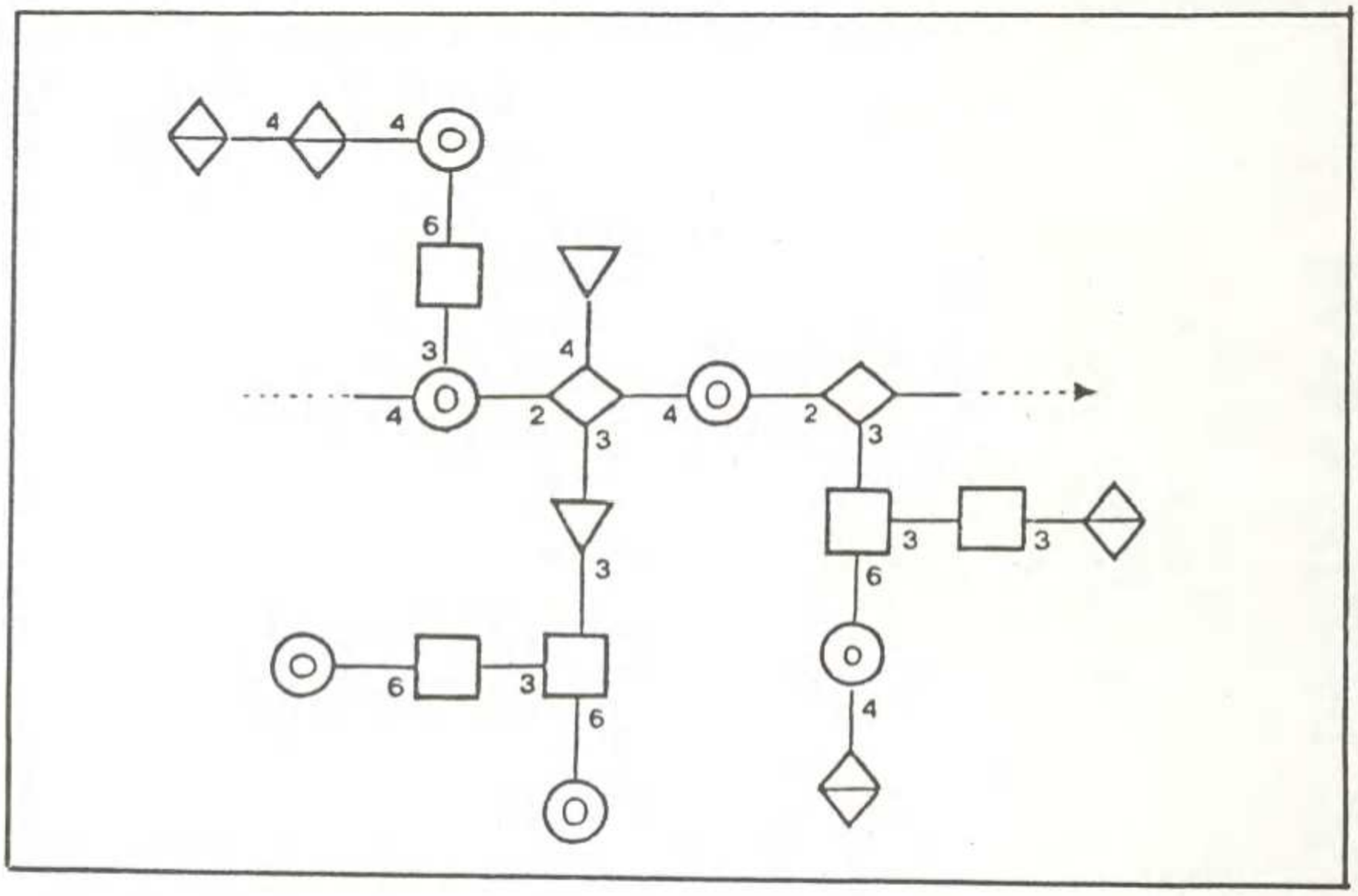


FIGURE 1 : A proposal for the arrangement of sugar residues in *Encephalartos* gum. Legend as per Table 1.

EDITOR'S NOTE: The text of this article was prepared in large part by Roy Osborne from an extended manuscript provided by D.C. Stephens and A.M. Stephen. Readers interested in this field of work are also referred to the paper by De Luca, Moretti, Sabato and Siniscalco Gigliano (1982), "A comparative study of cycad mucilages", 'Phytochemistry' 21: pp 1609-1611.

D.C. Stephens and A.M. Stephen are from the University of Cape Town. Roy Osborne is from the University of Natal.

A TRIBUTE TO DR DYER

From "University of Natal Chronicle", December 1987.

The Allen and Dorothy Dyer Reading Room in the University **Archives, Pietermaritzburg,** opened on 11th November, will serve as a fitting tribute to the man whose generosity made it possible, **Dr Allen Dyer.**

Graduate and long-time friend of the University, Dr Dyer donated no less than R63 000 to the Pietermaritzburg campus over the past two years, specifying that an amount of R3 000 be allocated to Archives. Sadly, he died barely a month ago.

One of South Africa's most distinguished scientists, Robert Allen Dyer was a student of Natal University College, and was awarded the Ph D degree in 1937. A Botanist of world renown, he served for many years as Chief of the Division of Botany and Plant Pathology and Director of the Botanical Survey of Southern Africa and, it is largely due to his vision that there exists today, in Pretoria, a National Herbarium unparalleled on the African continent. With some 450 publications to his credit, including major works which have become classics, Dr Dyer held office in various professional bodies relating to his field, and was the recipient of honours and awards — nationally and internationally — too numerous to mention. The University extends its deepest sympathy to his family.

CYCADS OF AUSTRALIA

by Len Butt

Small cycads of N.S.W.

continued

MACROZAMIA STENOMERA

Being similar to M. heteromera, this cycad has often been mistaken for it and has even been listed as a variety of it. The caudex is subterranean, the fronds up to ten in number, and the bases of the pinnae a burnt yellow colour. These lines of colour where the pinnae meet the rachis are not noticeable through many Macrozamia species. The habitat is Northern Tablelands and the Nandewar Range of New South Wales, spilling over into districts where M. heteromera occurs.

MACROZAMIA SPIRALIS

Previously know as M. corralipes, this is a small plant having a subterranean caudex with no visible trunk. Fronds up to twelve in number, and up to 90 cm long have been noted, with the base of the petiole being bare and the rachis only 40 cm long. Pronounced spiralling is evident in the rachis. The seed cones measure approximately 20 cm, and the seed is orange-red rather than orange, deeper in colour than in other species. The habitat of the true "spiralis" is a restricted area of central New South Wales, north-west of Sydney into the central west slopes of the Dividing Range. It is native to the Port Jackson area. Other species overlap its territory and it has been found growing with M. communis and related species.

MACROZAMIA SECUNDA

Another small species, M. secunda, is found growing around Mudgee and Gilgandra. Also found in areas with M. spiralis, it is very similar, a noted difference being the concave

Young leaf of M. stenomera

shape of the petiole and the crowded narrow pinnae along the rachis. The pinnae arise at an acute angle to each other and the fronds are often hidden among surrounding herbage.

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

CYCAD SEED KERNEL MORPHOLOGY

by Roy Osborne

The present taxonomy of cycads is based almost entirely on a combination of leaf and cone characters. Useful as these are, there are still areas of considerable uncertainty in separations of species, and present schemes showing relationships between taxa are at best highly speculative. In order to gain a better understanding of both the validity of taxonomic rank and the various relationships between cycads, we need to consider a great deal more. Some progress in this direction is being made at present, with biochemical data providing much useful input. Further contributions that are anticipated are the details of comparative cone-scale morphology (work by Douglas Goode on Encephalartos), the detailed analysis of pollen from all taxa (a project under way at the University of Pretoria), the chemical analysis of leaf wax hydrocarbons (a project being undertaken by the author together with Professors Antonio and Maria Luiza Salatino) and the chemical analysis of gummy exudates (work by Professor Alastair Stephen and Daphne Stephens at the University of Cape Town).

With the advent of the Society's Seed Bank, it seemed opportune to start gathering as much information about seed characteristics as possible. As yet, little attention has been paid to this potentially useful source of data.

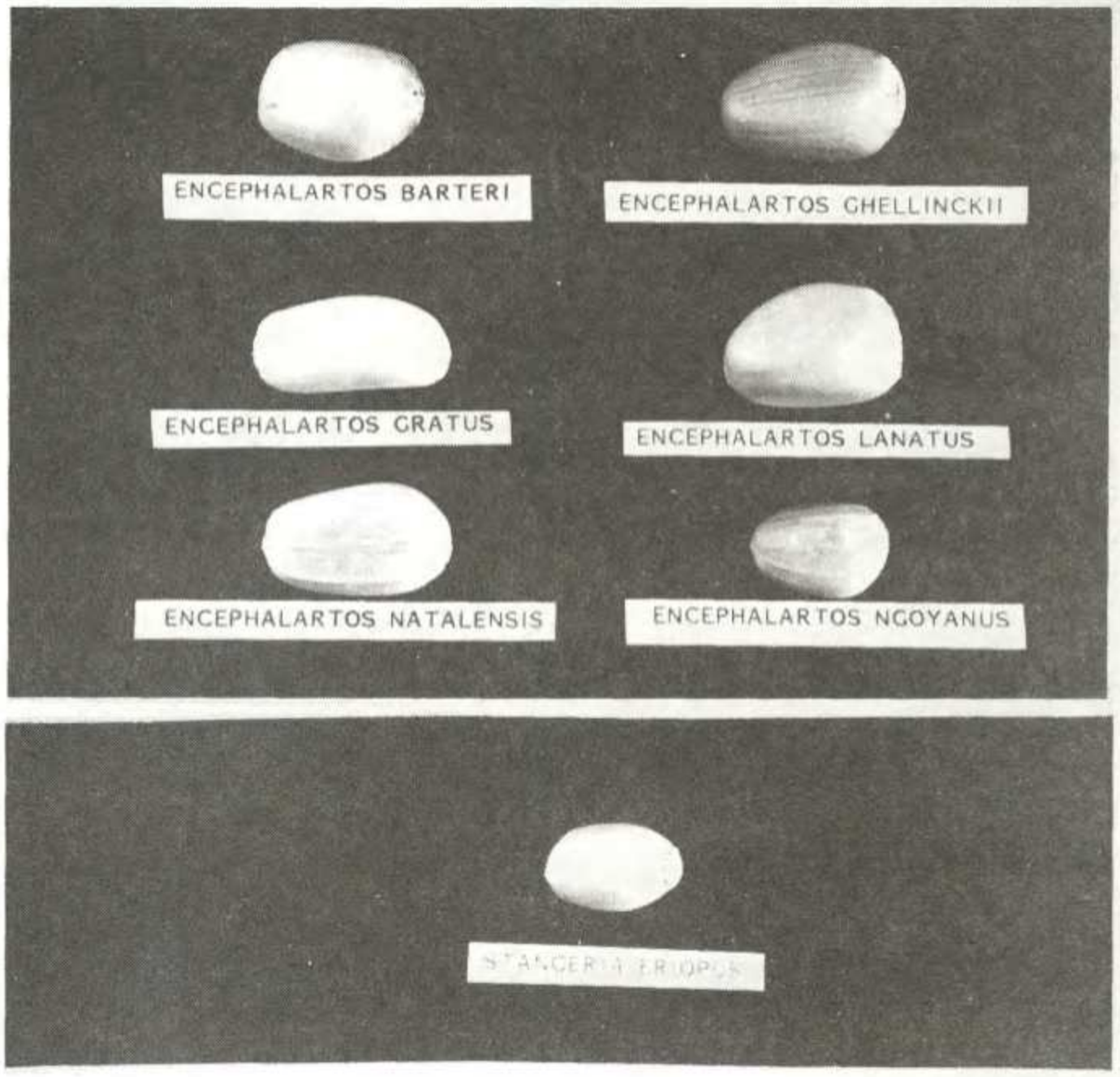
The only reference which gives any quantitative data about cycad seeds is Willie Tang's article in ENCEPHALARTOS no. 9, pages 8 and 9, where the comparative seed volumes of some different taxa are shown.

I now wish to present some very preliminary data collected during 1987.

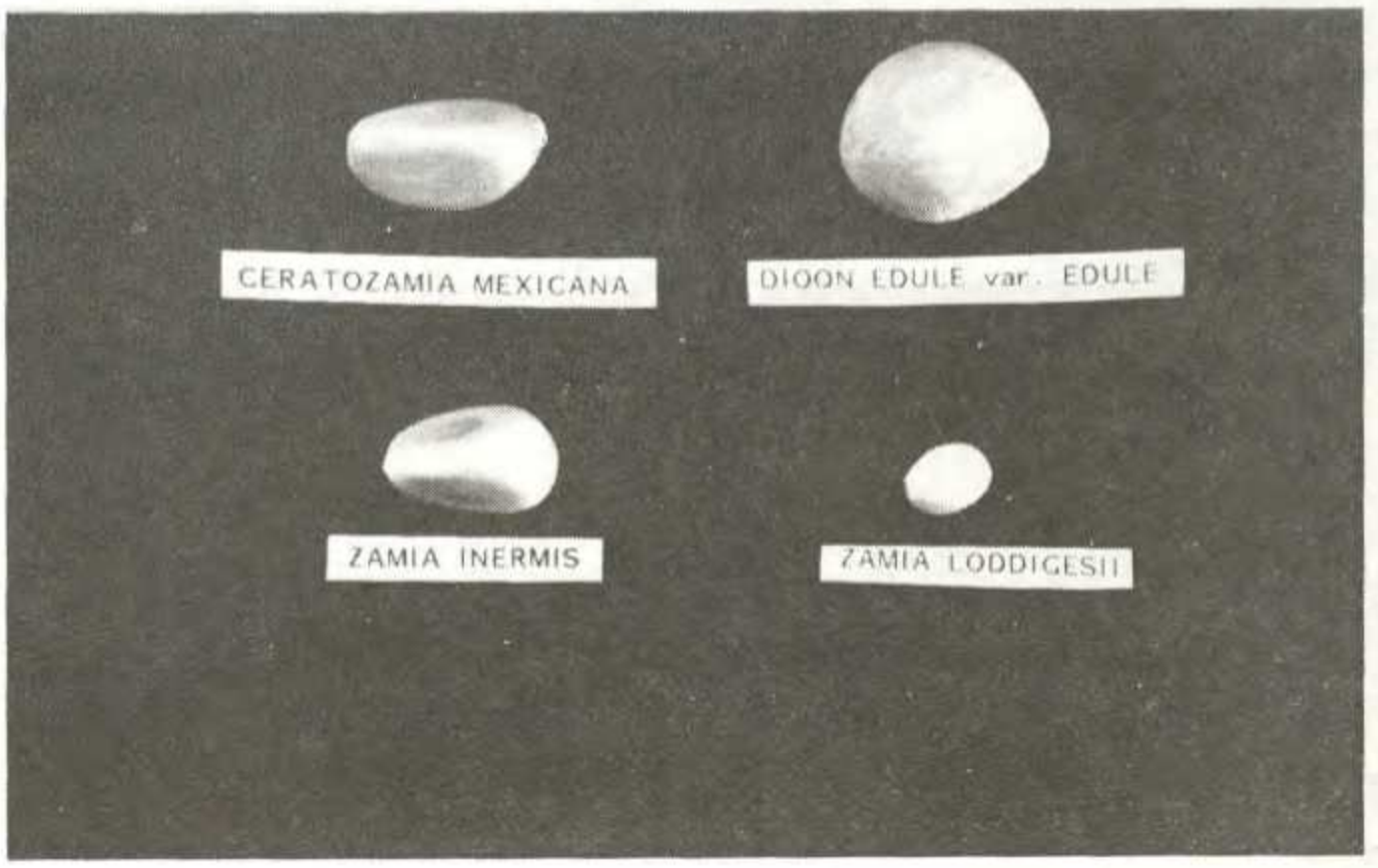
The accompanying photographs show that there are clearly recognizable differences between the seed kernels of different cycads. Some time ago, in a somewhat naive spurt of over-confidence, I told Dennis Stevenson in New York that one could tell any cycad seed kernel from another by simple inspection - only to be tested and proved horribly wrong with some of our own Encephalartos material! But the lesson was well learned (Dennis is a great teacher) - casual observation is not precise enough. So it was back to the drawing board: how could we record information to improve this precision?

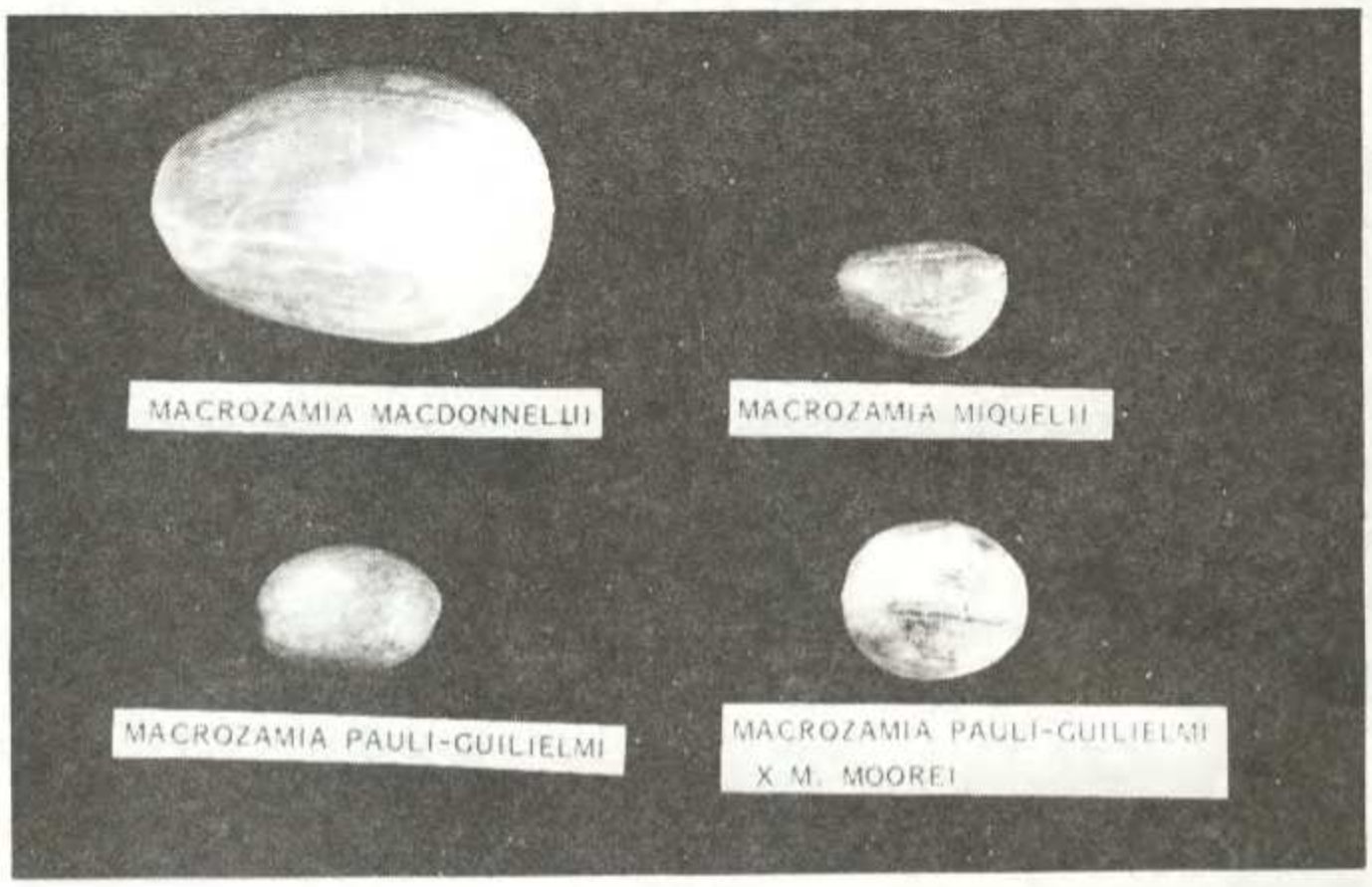
Tables 1 and 2 illustrate some of the more easily measured and described features of cycad seed kernels; as more samples come to hand, so these data can be extended eventually to comprise a thorough survey. Meanwhile, at this preliminary stage, it is clear that there are most certainly trends in size, shape, ribbing patterns, appearance at the micropylar end and the pattern at the chalazal end (point of attachment to the cone scale). These combinations of characters might well contribute to solving questions of taxonomic rank. But more than that, it is my belief that surveys of this sort might assist in drawing up more credible schemes of relationships between all taxa in the Cycadales.

I am indebted to Mrs Lorraine van Hoof of the University of Durban-Westville for her kind assistance with the seed photography, and to Prof. Nat Grobbelaar for his comments on a draft of this text.



Photographs illustrating the shape and size of some African cycad seed kernels (above) and some Meso-American cycad seed kernels (below). Scale half actual size.





Photographs illustrating the shape and size of some Australasian cycad seed kernels. Scale half actual size.

TABLE 1 : CYCAD SEED KERNEL MORPHOLOGY : Descriptive Aspects

SPECIES	SHAPE	SURFACE	MICROPYLAR END	CHALAZAL END
Bowenia spectabilis	Irregularly 3-4 sided	Smooth	Small, pointed	Slightly pitted in radial pattern
Bowenia serrulata	Irregularly spherical	Smooth	Small, inconspicuous	Slightly pitted, sometimes pointed
Ceratozamia mexicana	Irregularly 3-4 sided	Smooth, slight ribbing pattern	Star-shaped	Protruding, pitted
Cycas armstrongii	Slightly flattened sphere	Smooth	Small, on lateral crack	Sharp leathery beak
Cycas kennedyana	Slightly flattened sphere	Smooth	Small, pointed, on prominent lateral crack	Sharp leathery beak
Cycas media	Slightly flattened sphere	Smooth	Small, pointed, on lateral crack	Sharp leathery beak
Cycas revoluta	Approx spherical	Smooth, slight ribbing pattern	Small, on lateral crack	Sharp leathery beak
Dioon edule var edule	Approx spherical	Smooth, slight ribbing pattern	Star-shaped	Recessed orifice
Encephalartos barteri	Irregularly 3-4 sided	Smooth, faintly ~13 ribbed along long axis	Star-shaped	Heavily pitted
Encephalartos ghellinckii	Irregularly 3-4 sided	Numerous small grooves along long axis	Star-shaped	Heavily pitted
Encephalartos gratus	Irregularly 3-4 sided	Slight ribbing pattern along long axis	Star-shaped	Heavily pitted
Encephalartos lanatus	Irregularly 3-4 sided	Slight ribbing pattern along long axis	Slightly protruding, star-shaped	Heavily pitted
Encephalartos natalensis	Irregularly 3-4 sided	Prominently 10-15 ribbed along long axis	Pointed, star-shaped	Heavily pitted
Encephalartos ngoyanus	Irregularly 3-4 sided	Prominent ~15 ribbed along long axis	Star-shaped	Heavily pitted
Lepidozamia peroffskyana	Irregularly 3-4 sided	Grooved pattern along long axis	Star-shaped	Heavily pitted
Lepidozamia hopei	Irregularly 3-4 sided	Grooved pattern along long axis	Star-shaped	Heavily pitted
Macrozamia macdonnellii	Irregularly 3-4 sided	Smooth, faintly grooved along long axis	Star-shaped	Slightly prominent, pitted
Macrozamia miquelii	Irregularly 3-4 sided, assymetrical	Slight ribbing pattern along long axis	Slightly prominent star-shaped	Raised, irregular
Macrozamia pauli-guilielmi	Irregularly 4 sided	Faintly 12-15 ribbed along long axis	Slightly recessed	Slightly prominent, pitted
Macrozamia pauli-guilielmi x M moorei	Irregularly 4 sided	13-14 ribbed along long axis	Star-shaped	Flush with surface, pitted
Stangeria eriopus	Approx spherical	Smooth, slight ribbing pattern	Star-shaped	Ring of pits on raised corona
Zamia loddigesii	Irregularly 3-4 sided	Smooth	Pointed, star-shaped	Slightly pitted
Zamia inermis	Irregularly 3-4 sided	Smooth	Pointed, star-shaped	Slightly pitted

TABLE 2 : CYCAD SEED KERNEL MORPHOLOGY : Quantitative Aspects

SPECIES	ORIGIN OF SAMPLE	NO OF SEED EXAMINED	MEAN LENGTH CM	MEAN WIDTH CM	L/W RATIO	VOLUME CM^3
Bowenia spectabilis	Australia	10	2,40 ± 0,12	1,75 ± 0,12	1,37 ± 0,13	3,59 ± 0,42
Bowenia serrulata	Australia	5	3,09 ± 0,18	2,44 ± 0,14	1,27 ± 0,06	8,46 ± 1,59
Ceratozamia mexicana	Veracruz	10	2,62 ± 0,23	1,56 ± 0,10	1,68 ± 0,16	2,57 ± 0,61
Cycas armstrongii	Australia	10	3,64 ± 0,15	3,05 ± 0,11	1,19 ± 0,06	14,4 ± 1,9
Cycas kennedyana	Australia	4	3,60 ± 0,10	3,20 ± 0,10	1,13 ± 0,09	15,3 ± 3,3
Cycas media	Australia	5	3,16 ± 0,21	2,49 ± 0,10	1,27 ± 0,09	8,30 ± 0,70
Cycas revoluta	Univ of Natal, Pmb	10	3,77 ± 0,07	2,73 ± 0,14	1,43 ± 0,08	11,7 ± 2,0
Dioon edule var edule	Veracruz	10	2,67 ± 0,13	2,26 ± 0,13	1,27 ± 0,11	6,44 ± 0,76
Encephalartos barteri	Ghana	10	2,75 ± 0,16	1,95 ± 0,08	1,41 ± 0,09	5,80 ± 0,90
Encephalartos ghellinckii	Natal	10	2,98 ± 0,15	2,18 ± 0,12	1,37 ± 0,13	6,14 ± 0,48
Encephalartos gratus	FTG, Florida	10	3,30 ± 0,18	1,65 ± 0,07	2,01 ± 0,17	4,74 ± 0,27
Encephalartos lanatus	E Transvaal	10	2,94 ± 0,14	2,29 ± 0,18	1,29 ± 0,15	6,59 ± 0,86
Encephalartos natalensis	Greytown	10	3,06 ± 0,17	1,91 ± 0,10	1,61 ± 0,13	5,60 ± 0,89
Encephalartos ngoyanus	Durban	10	2,18 ± 0,17	1,73 ± 0,10	1,26 ± 0,08	3,11 ± 0,43
Lepidozamia peroffsykana	PCSA	10	4,73 ± 0,26	3,33 ± 0,30	1,47 ± 0,18	21,8 ± 3,1
Lepidozamia hopei	Australia	14	4,89 ± 0,41	3,12 ± 0,28	1,57 ± 0,12	25,8 ± 7,8
Macrozamia macdonnellii	Australia	6	5,69 ± 0,53	3,80 ± 0,22	1,50 ± 0,16	41,0 ± 8,6
Macrozamia miquelii	Australia	15	2,38 ± 0,26	1,73 ± 0,17	1,37 ± 0,12	3,35 ± 0,82
Macrozamia pauli-guilielmi	Australia	5	2,48 ± 0,07	1,91 ± 0,09	1,30 ± 0,07	4,20 ± 0,23
Macrozamia pauli-guilielmi x M moorei	Australia	8	2,54 ± 0,06	2,06 ± 0,17	1,24 ± 0,10	5,36 ± 0,52
Stangeria eriopus	Durban	10	2,07 ± 0,22	1,54 ± 0,07	1,35 ± 0,17	2,33 ± 0,39
Zamia loddigesii	Louisiana	10	1,36 ± 0,12	0,90 ± 0,06	1,52 ± 0,17	0,60 ± 0,06
Zamia inermis	Veracruz	5	2,42 ± 0,17	1,67 ± 0,19	1,48 ± 0,25	2,76 ± 0,35

Note: The ± figure in each case represents the standard deviation from the mean

EX PRESS

Unexplained cycads in gardens could result in prosecution

Post Reporter

PEOPLE who have cycads in their gardens without a permit have until March 31 to acquire the permits — or else!

"After that date," says a spokesman for the Department of Nature Conservation, "we start handing over individual cases to the prosecutor.

"Our office has been inundated with applications. Since February we have received about 60 applications.

"In each case we go to the house concerned and the owner of the cycad has to give us a satisfactory explanation where the cycad came from and how it came to be in that person's possession.

"In some cases the cycad is in the garden when the person takes the house over, but if there are clear signs that the cycad has recently been planted and we don't get a satisafactory explanation for this we are obliged to hand the matter over to the law.

"We are in fact prosecuting a case in Grahamstown.

"Here in Port Elizabeth we've been astonished at the number of people calling us and reporting the presence of cycads in other people's gardens.

"We rather thought that PE was a don't-care place, but oddly enough as far as the cycads are concerned the public has been most helpful."

● **The cycad is a protected species. Possession of them without a permit is illegal.**

EVENING POST 29 February 1988

Help police find cycad thieves

THE POLICE have appealed to the public to come forward with information regarding the theft of rare cycads from gardens in Montclair, Yellowwood Park and Brighton Beach.

RAIDED

The garden of Warrant Officer C.F. Calitz of Anelo Road, Montclair, has been raided twice during the past two weeks with 11 cycads being dug up in one night.

Another seven plants were stolen from a Yellowwood Park Garden and reports of similar thefts have been received from Brighton Beach and Cowies Hill.

It is believed that two white men, one with light and the other with dark hair, driving a green or blue mini, were involved in the theft of the plants from W.O. Calitz, while the thieves from Cowies Hill might have driven in a kombi.

"It appears that the men drive around a neighbourhood during the day to check out gardens with these plants and then dig them out at night. They seem to know the area well," Lt. Geel told the Southlands SUN.

He appeals to anyone with information on people who collect or deal in cycads and who own or drive a mini, to phone the Montclair police or W.O. Calitz at home at 421189 (after hours).

SOUTHLANDS SUN 4 December 1987

POLLEN EXCHANGE STUIFMEELRUIL

In April last year the magazine "Garden and Home" published an article on the Pollen Exchange. This elicited numerous enthusiastic enquiries from the public as well as from members of the Cycad Society. Regrettably I was unable to accede to many of the requests as the response from our members for information on their male plants is still very inadequate. To date only 38 out of our more than 500 members have returned the questionnaire detailing the mature male plants in their collections.

In evaluating these replies it is interesting to note that the members who have replied collectively own 424 mature male plants of whom two members list 132 plants between them. If these are removed from the total, the average per member is 7 plants. I am sure that there are many more members who could assist us with pollen.

The most common species in collections are Encephalartos altensteinii (35), E. caffer (25), E. ferox (28), E. horridus (39), E. lebomboensis (25), E. lehmannii (18), E. natalensis (37), E. trispinosus (36), E. villosus (58) and Stangeria eriopus (21). Though no cycad can really be considered "common", we nevertheless urgently require pollen sources for the rarer species such as E. ghellinckii (0), E. heenanii (1), E. woodii (0), E. cupidus (2), E. eugene-maraisii (3), E. inopinus (3), E. laevifolius (4) and E. latifrons (4).

A questionnaire is again enclosed with this issue and I would like to appeal to members to let us have them back as soon as possible. I am receiving requests for pollen every week as the female cones are now emerging. I would also like to ask those members who have responded in previous years to again complete the questionnaire so that we can update their records. After the good rains I have several plants coning for the first time this year in my garden, including a 10 year old E. natalensis from seed. I am sure that many members have new coning records for our data bank. Once the questionaire is returned, the data is fed into a computer and categorised into species and areas.

For the benefit of new members: the Pollen Exchange does not store pollen for distribution but merely assists members by putting them in touch with likely sources in their own areas. It is therefore imperative that members contact me in good time - in fact as soon as the female cone emerges. With a couple of weeks in hand it is possible to airmail an immature male cone just before it starts shedding pollen. The pollen sacs on the undersides of the cone scales will mature progressively over a period of several days and fresh pollen can be obtained in this way. Do not use a plastic bag as this will cause the cone to sweat in transit. Place the entire cone in a paper bag or newspaper and tape the ends.

Many of our members only request pollen once the red or yellow seeds are visible prior to shedding. By this time it is much too late. It is vital to keep a close watch on the female cone to determine the optimum time for pollination. The top sterile scales will open slightly but in some species, notably E. ferox, this is very difficult to observe. Adverse weather conditions, particularly hot, dry weather, will also affect the size of the opening. To further assist those wishing to pollinate their plants, may I draw your attention to the excellent articles by Willie Tang in ENCEPHALARTOS no. 7 and no. 8.

In the Garden and Home article I menioned that we had received a request from an Austrian member, Alois Holsbauer, on behalf of the Botanical Garden of Tenerife in the Canary Islands for pollen of E. laurentianus (a species from Zaire). One of our New Zealand members, Dick Endt, responded to this and sent me a picture of E. laurentianus that he had photographed in Malaga. I was then

able to inform Tenerife that in future years they need look no further than Spain for pollen. Surely this combined effort between Austria, South Africa, Spain and New Zealand to assist a Zairian cycad on the Canary Islands is an excellent example of international cooperation and conservation.

I would like to conclude by thanking all the members who have participated by sending in their pollen records and especially the Department of Botany of the University of Pretoria, the Durban Gardens and the Lowveld Botanic Garden for their assistance and generosity.

CYNTHIA GIDDY

FROM THE BOOKSHELF

NATIONAL BOTANIC GARDENS PUBLICATIONS

The National Botanic Gardens regularly publishes books on various aspects of the South African Flora. Amongst the current works is Volume 3 of "Pelargoniums of Southern Africa" by J.J.A. van der Walt and our Executive Committee member, Piet Vorster.

Approximately 200 species of Pelargonium are known to grow in Southern Africa, with a scattering in East Africa, the Middle East, Australia and the islands of Madagascar, St. Helena and Tristan da Cunha. Two volumes in this series appeared in 1977 and 1981 respectively, in each of which 50 species were described and illustrated in full colour. In this third volume a further 50 species, including some representatives from other parts of the world, are described and some are illustrated for the first time. The text includes a detailed scientific description of each species, notes on geographical distribution, habitat, history and cultivation, as well as distribution maps and habit sketches. This volume is uniform in design to the first two and will make an attractive addition to the series, being of interest to the botanist, the enthusiastic amateur and the flower-lover.

Other current books of interest are "The Moraeas of Southern Africa" by Peter Goldblatt and "The Botany of the Southern Natal Drankensberg" by Olive Hilliard and Bill Burtt.

Another one of our members, Donal P. McCracken and his wife Eileen, are responsible for the book "The Way to Kirstenbosch" which will be available later this year.

Full details of these publications are available from: The National Botanic Gardens, Private Bag X7, Claremont 7735.

ROY OSBORNE

SAADBANK

Die volgende saad is nou beskikbaar by die Saadbankbeampte, Danie Nel (Bowkerweg 120, Escombe, 4093; tel. no. 031-442505, saans): Encephalartos natalensis, E. villosus, Cycas revoluta.

SEED BANK

The following seed is nou available from the Seed Bank Officer, Danie Nel (120 Bowker Road, Escombe, 4093; tel. no. 031-442505, evenings): Encephalartos natalensis, E. villosus, Cycas revoluta.

FROM THE PRESIDENT

This issue of ENCEPHALARTOS ushers in the fourth year of the Cycad Society of Southern Africa. Now on a firm basis, with some 600 members, we look forward to another successful year and to active participation by members in Society activities. This year also sees a new Executive Committee, details of which appear elsewhere in this issue. I am pleased to welcome new co-opted members Pieter Stroebel and Roy Shooter to the 1988/89 Committee.

Welcome news is the formation of the Eugene Marais branch of the Society in the Southern Transvaal. We wish this new regional group every success. Members interested in joining the new branch are invited to contact the secretary, Ben Visser (3 Troupand Street, Brits, 0250; tel. no. 01211-20151 at work or 01211-22928 at home) for details.

Full details of the Society's financial standing at the end of 1987 are now available and reflect a fairly healthy fiscal status. Copies of the financial report have been distributed to all Committee members. Any members wishing to obtain a copy of these financial documents are welcome to contact me in that regard. We are indebted to Angela Osborne and Willem Nel for their consciencious efforts in keeping track of the funds and preparing the financial report. Mr L.M.D. Vorster has kindly agreed to take over the accounting responsibilities for 1988.

Members have generally responded well to the invoice system for 1988 membership payments. The Society acknowledges the generosity of the many members who have included a donation at the time of their membership renewal. Members who are presently in default must regrettably be removed from the membership list and will not receive any furhter copies of ENCEPHALARTOS.

VAN DIE PRESIDENT

Hierdie uitgawe van ENCEPHALARTOS lui die vierde jaar van die Broodboomvereniging van Suidelike Afrika in. Ons is nou op 'n vaste basis, met ongeveer 600 lede, en ons sien uit na nog 'n suksesvolle jaar en na aktiewe deelname deur lede in Vereniging-aktiwiteite. Daar is ook vanjaar 'n nuwe Uitvoerende Komitee, waarvan besonderhede elders in hierdie uitgawe verskyn. Ek verwelkom graag die nuwe gekoöpteerde lede, Pieter Stroebel en Roy Shooter, op die 1988/89-Komitee.

Welkome nuus is die stigting van die Eugene Marais-tak van die Vereniging in die Suidelike Transvaal. Ons wens hierdie nuwe streeksgroep alle sukses toe. Lede wat belangstel om by hierdie nuwe tak aan te sluit, word genooi om met die sekretaris, Ben Visser (Troupandstraat 31, Brits, 0250; tel. no. 01211-20151 by die werk of 01211-22928 tuis) in verbinding te tree vir meer besonderhede.

Volledige besonderhede oor die Vereniging se finansiële posisie aan die einde van 1987 is nou beskikbaar en toon 'n redelike gesonde geldelike toestand. Afskrifte van die finansiële verslag is aan alle Komiteelede gestuur. Lede wat afskrifte van die finansiële dokumente verlang, kan met my in verbinding tree. Ons spreek ons dank uit aan Angela Osborne en Willem Nel vir hulle pligsgetroue pogings om boek te hou van die fondse en vir die voorbereiding van die finansiële verslag. Mnr. L.M.D. Vorster het goedgunstiglik ingestem om die rekeningkundige verantwoordelikhede vir 1988 oor te neem.

Lede het oor die algemeen goed gereageer op die faktuur-metode vir 1988-ledegeldbetalings. Die Vereniging erken die vrygewigheid van die baie lede wat 'n donasie ingesluit het met die hernuwing van hulle lidmaatskap. Lede wat nie hulle lidmaatskap hernu het nie, se lidmaatskap moet ongelukkig nou beëindig word en hulle sal nie verdere kopieë van ENCEPHALARTOS ontvang nie.

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Your new Committee has already been active and several projects are currently in hand. The seed bank operation will be upgraded to a more professional level under the careful control of Danie Nel. Incidentally, Danie reports that, up to the end of 1987, a phenomenal 18 000 cycad seeds have been distributed by the Society, involving some 15 South African species and 26 exotics. About 150 members are active participants in the seed bank, many of these being new recruits to the conservation-based philosophy of growing cycads from seed.

The first of several planned meetings between the Natal Parks Board and officers of the Society was held in January this year. We are confident of working together to our mutual advantage and thank Dr Grobbelaar and Mr Snyman of the NPB for their interest and co-operation.

Robert Campbell reports a brisk trade in both the posters and plant bags as publicized in ENCEPHALARTOS no. 12. We thank him for his kind efforts and note the contribution to the Society's funds. Additional supplies of both items may still be obtained from Robert as previously announced.

In closing, it is appropriate on behalf of the Society, to offer our sympathy to all members who have lost plants and other valuables as a result of the recent series of devastating floods in South Africa.

ROY OSBORNE

U nuwe Komitee is reeds aktief en daar word aan verskeie projekte aandag geskenk. Die saadbankaktiwiteite sal tot 'n meer professionele vlak verhoog word, onder die versigtige beheer van Danie Nel. Terloops, Danie rapporteer dat tot die einde van 1987 'n verstommende 18 000 broodboomsade deur die Vereniging versprei is, waarby ongeveer 15 Suid-Afrikaanse en 26 buitelandse spesies betrokke was. Ongeveer 150 lede is aktiewe deelnemers aan die saadbank, baie van hulle nuwe toetreders tot die bewaringsgegronde filosofie van die kweek van broodbome van saad.

Die eerste van verskeie beplande vergaderings tussen die Natalse Parkeraad en ampdraers van die Vereniging het in Januarie vanjaar plaasgevind. Ons is vol vertroue dat ons kan saamwerk tot ons wedersydse voordeel en ons bedank Dr. Grobbelaar en mnr. Snyman van die Parkeraad vir hulle belangstelling en samewerking.

Robert Campbell rapporteer dat beide die plakkate en die plantsakkies wat in ENCEPHALARTOS no. 12 geadverteer is, vinnig verkoop. Ons bedank hom vir sy vriendelike pogings en erken die bydrae tot die Vereniging se fondse. Verdere voorrade van beide items kan nog by hom verkry word, soos voorheen aangekondig.

Laastens is dit gepas om, namens die Vereniging, ons simpatie te betuig teenoor alle lede wat plante en ander waardevolle items verloor het as gevolg van die onlangse reeks vernietigende oorstromings in Suid-Afrika.

ROY OSBORNE

NURSERY NEWS

Bruce and Joan Bursey of Lowlands Nursery (P.O. Box 9, Kei Road 4920; tel. 044337-731) have advised us that they have substantial stocks of both South African and exotic cycad seedlings for sale. Export shipments, with all the required documentation, can be arranged. Current nursery stocks include some 16 species of Encephalartos, Stangeria and several species of Dioon, Macrozamia, Zamia and Lepidozamia. Several other South African plants, including Euphorbia and Crinum species are also propagated at the nursery. A catalogue with details of prices and conditions of sale is available on request, and visitors are welcome by appointment.

BITS AND PIECES STUKKIES EN BROKKIES

VERSKONING

Ons vra weer eens om verskoning vir die feit dat ENCEPHALARTOS no. 12 u laat bereik het. Dit was die slagoffer van die einde van die jaar-stormloop.

APOLOGY

We apologize, once again, for the fact that ENCEPHALARTOS no. 12 reached you late. It was the victim of the end of year rush.

CYCAD CROSSWORD

Because of the late arrival of ENCEPHALARTOS no. 12, the closing date for sending in your completed cycad crossword is now extended to 30 April 1988.

MACROZAMIA ROOT STUDIES

David Webb of the Forest Biotechnology Centre in British Columbia and J. Henry Slone of Washington University in St. Louis have published the latest of a series of investigations on the formation and anatomy of cycad roots grown in artificial culture. The latest paper, entitled "Anatomy of Macrozamia communis lateral roots and root nodules formed in vitro, studied with light and scanning electron microscopy", appears in the American Journal of Botany, vol. 74, no. 11, 1987, pages 1625 to 1634. A limited number of reprints is available from Dr Webb on application (Forest Biotechnology Centre, BC Research, 3650 Westbrook Mall, Vancouver, British Columbia, V6S 2L2, Canada.)

GOODE BOOK

A number of members have contacted the Society to enquire about the forthcoming book on cycads by Douglas Goode. The latest information we have is that the text is now almost complete and that the publishers, Winchester-Struick, anticipate release at the end of 1988 or early in 1989.

MEMBERSHIP NUMBER

It would be appreciated if members writing to officers of the society could quote their membership numbers in such correspondence. Your membership number is found on the top left hand side of the printed label used to address your ENCEPHALARTOS envelope.

LIDNOMMER

Dit sal waardeer word as lede wat aan beamptes van die Vereniging skryf, hulle lidnommers in sulke korrespondensie sal verstrek. U lidnommer verskyn links bo op die gedrukte plakker wat gebruik word om u ENCEPHALARTOS-koevert te adresseer.

CYCAD PURCHASES

Members buying indigenous cycad plants from nurseries, or who obtain indigenous cycads as a donation, are reminded that it is essential to obtain (and keep) a detailed invoice or letter of donation, which must describe the transaction fully. Without these documents one can be placed in a compromising position at a later stage.

BROODBOOM-AANKOPE

Lede wat inheemse broodboomplante van kwekerye koop, of wat inheemse broodbome as geskenk ontvang, word daaraan herinner dat dit noodsaaklik is dat hulle 'n gedetailleerde faktuur verkry (en hou), wat die transaksie volledig beskryf. Sonder hierdie dokument kan u op 'n later stadium in 'n baie moeilike situasie beland.

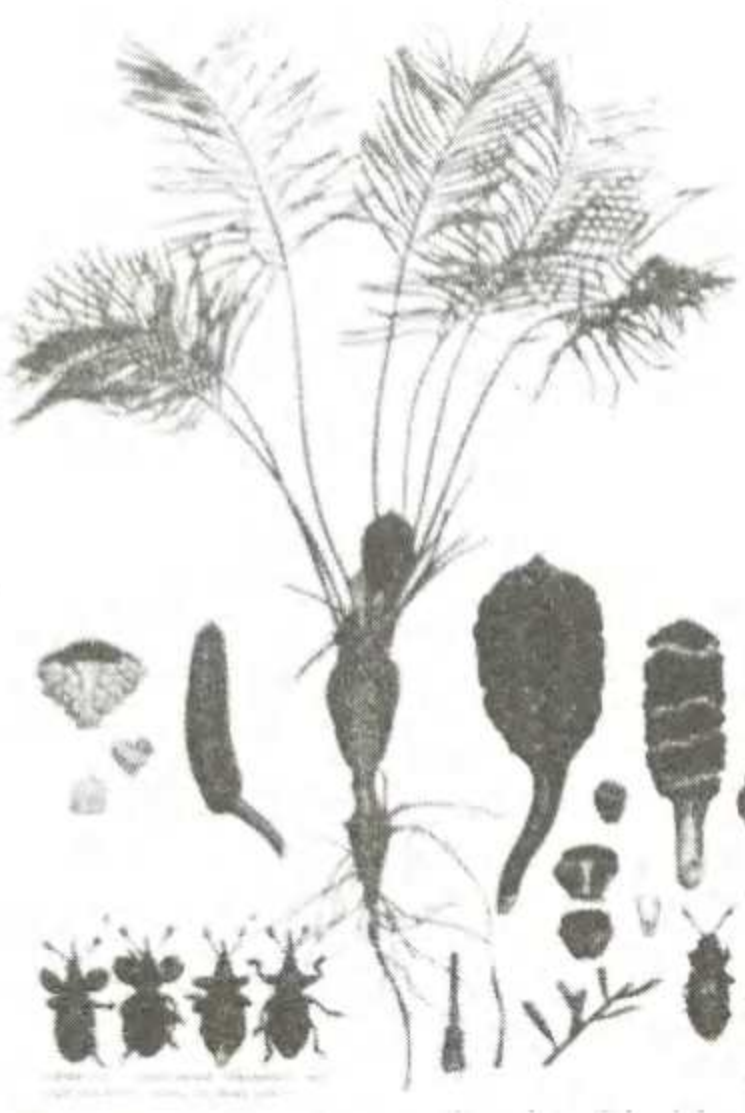
ADDRESSES UNKNOWN

The following members have apparently changed their addresses without informing us. If anyone knows where they can be contacted, please inform Membership Officer Pieter Stroebel: Mr George F. van der Watt, Dr. J.M.L. Joubert, Mrs Rosa van Wyk and Mr Matthew Nel.

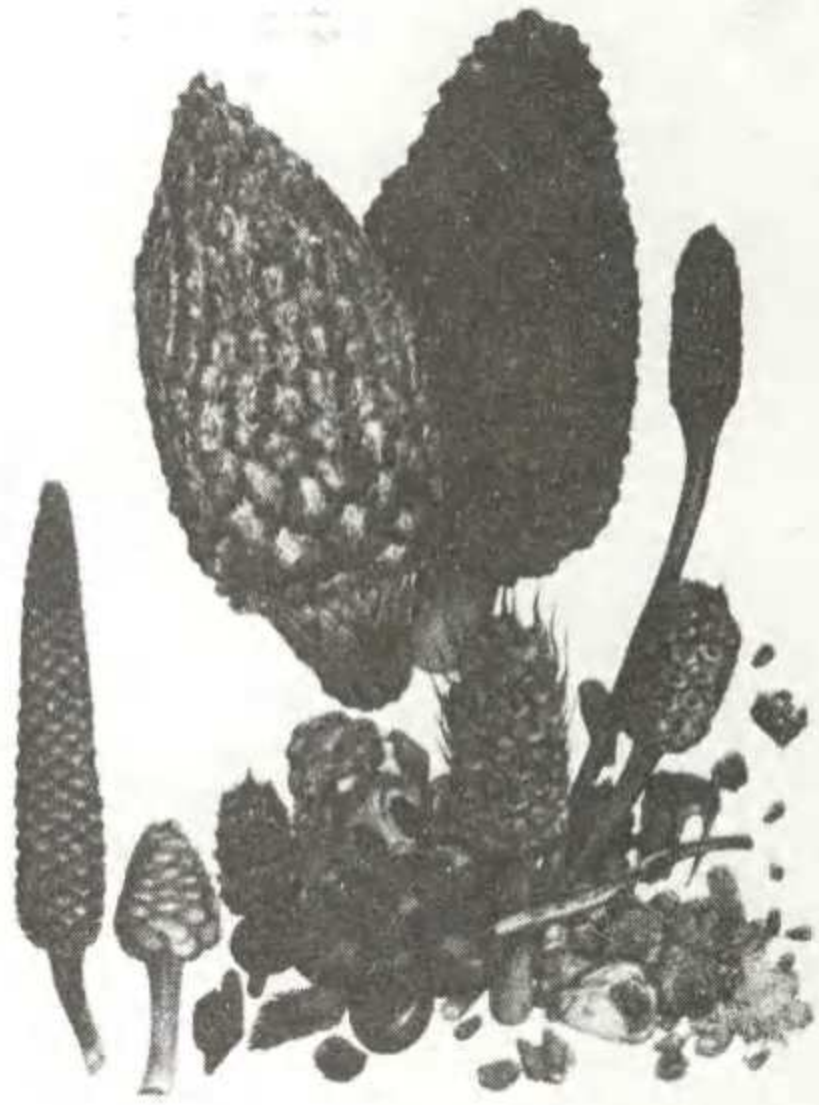
CYCAD PRINTS

Prints of two original water-colour paintings of cycads are currently available from Fairchild Tropical Garden. The prints are fine-quality reproductions in brilliant life-like colour, measuring 23 x 35 inches (57 x 87 cm), and are printed on the best heavy-weight acid-free stock available. Each is a limited printing of 200 copies, signed by the artist, Priscilla Fawcett, known for her highly accurate yet artistic illustrations in a number of books and journals. Please specify whether the Zamia pumila or cycad cones print or both are desired. The price for the Zamia print is $40.00 for members of Fairchild Tropical Garden and $50.00 for non-members. For the cycad cones print the price is $50 and $60 respectively. Nominal handling and postage charges will be added.

Send orders to Fairchild Tropical Garden Bookstore, 10901 Old Cutler Road, Miami, Florida 33156, U.S.A. The invoice is payable by means of a cheque or money order upon receipt of the print(s).



Photograph of the Zamia pumila print



Photograph of the Cycad cones print

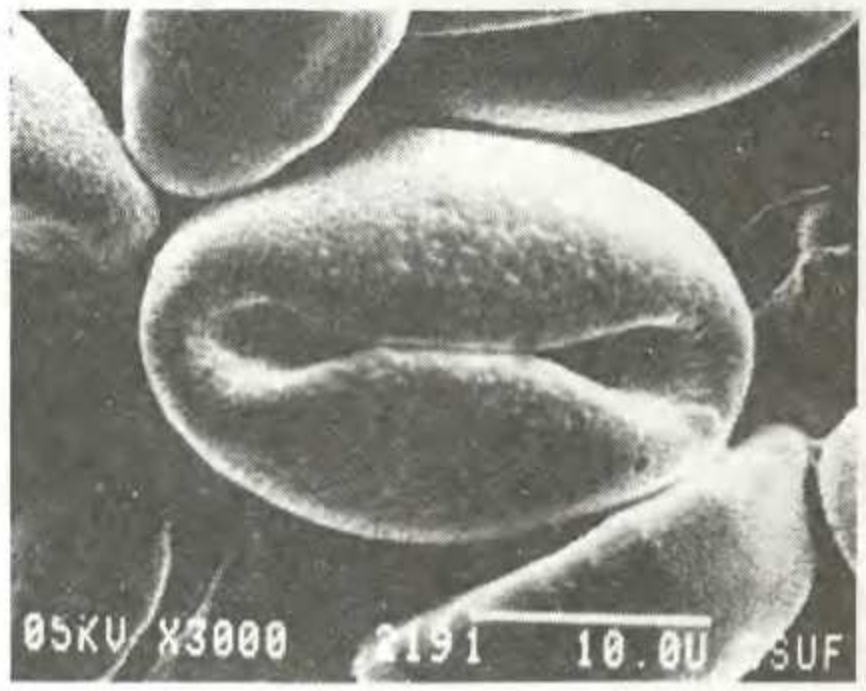
SAAB CONGRESS

The 1988 Congress of the South African Association of Botanists was held in Cape Town in January this year. It is pleasing to note that amongst the various presentations, there were two papers and one poster on South African cycad research topics.

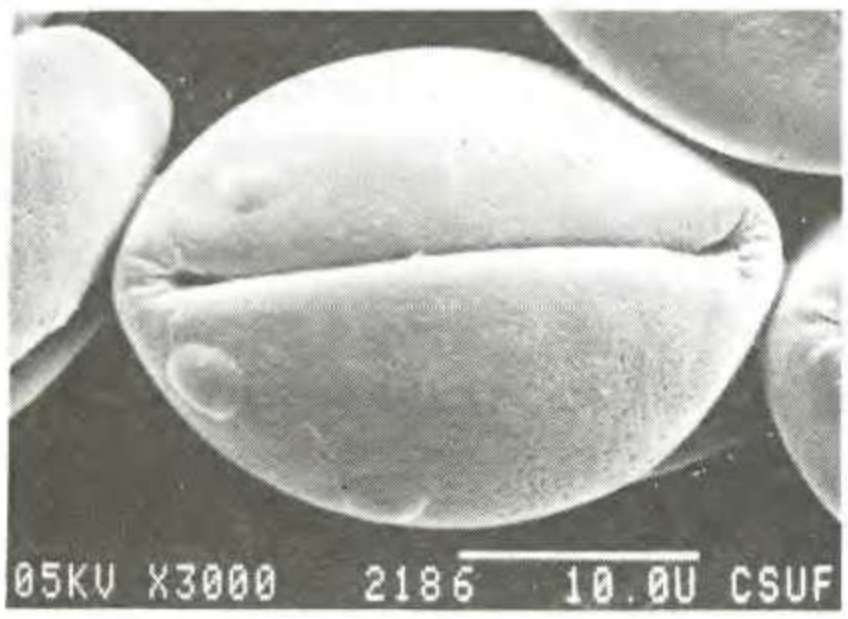
Society President, Roy Osborne (University of Natal) and members Nat Grobbelaar and Jeanne Marshall (both of Pretoria University) presented a poster on cycad pollen studies by means of the scanning electron microscope. Member Nat Grobbelaar, together with J.J.M. Meyer (also of Pretoria University), presented a paper on research conducted in the Modjadji Nature Reserve, involving the sex ratio in specimens of Encephalartos transvenosus of various heights. Dr Heidi Anderson of the Botanical Research Institute presented a paper on fossil studies, including studies on fossil Cycadales.

CYCAD POLLEN STUDIES

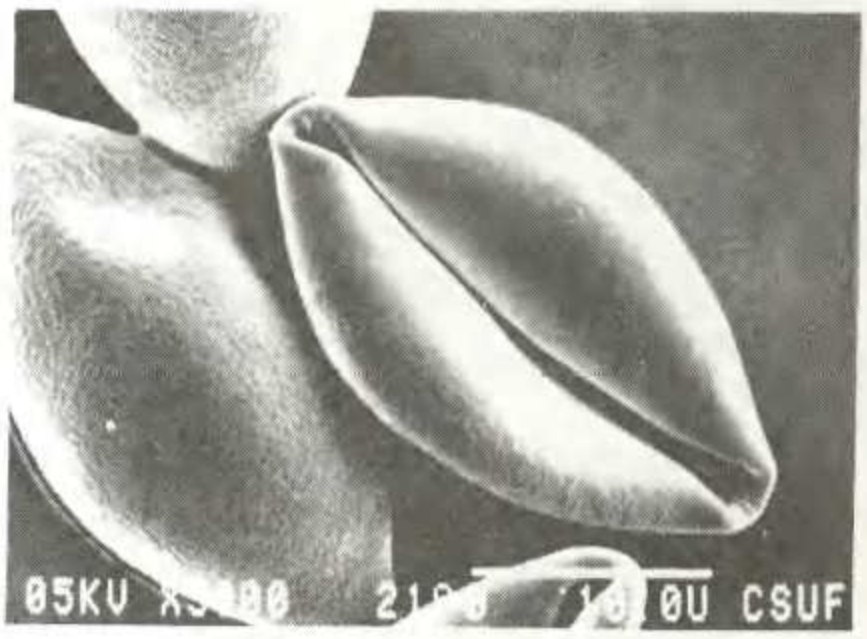
In ENCEPHALARTOS no. 8, pages 22 and 23, Loran Whitelock reported on his programme of examination of cycad pollen grains by scanning electron microscope techniques. In that issue we featured photographs of the microspores of Encephalartos arenarius and Stangeria eriopus. To extend the previous report, we are now reproducing the photographs of pollen grains from five exotic cycads. Work continues in this field of research. Local members Nat Grobbelaar, Jeanne Marshall and Roy Osborne are presently collaborating on a detailed study of Encephalartos microspores, a primary objective being to see whether the data can be used to postulate relationships between different species.



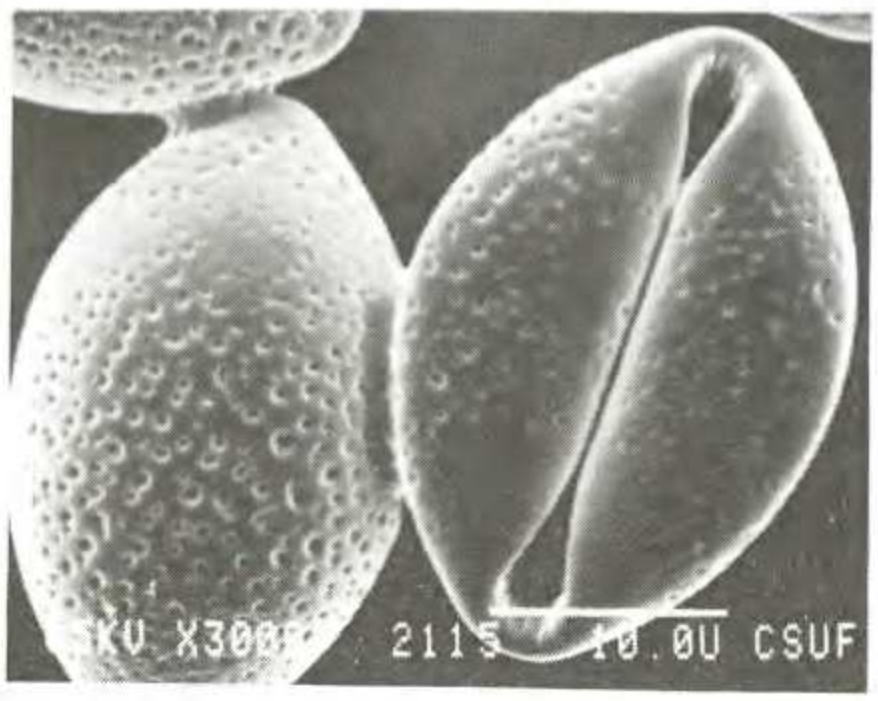
Zamia species from Honduras



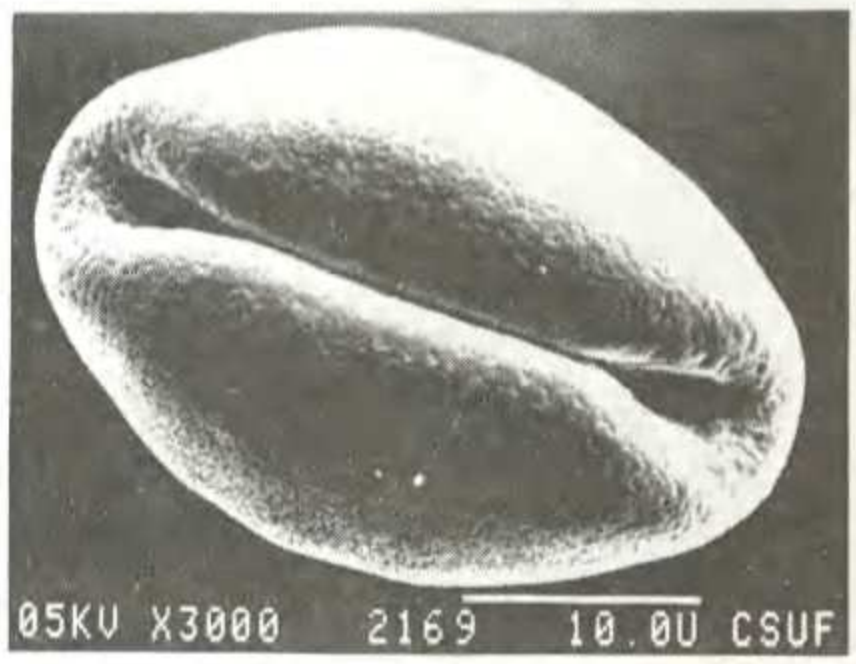
Dioon edule



Macrozamia lucida



Cycas pectinata



Ceratozamia mexicana

BACK COPIES OF ENCEPHALARTOS

Back copies of all issues of ENCEPHALARTOS are still available to new members who wish to complete their collections, or to anyone else who may be interested. They can be obtained at a price of R5,00 each for local and other African members, and R10,00 each for overseas members. The overseas price covers airmail postage (which at present amounts to more than R5,00 to Australia, for example). Please contact our Back Copies Officer, Roy Shooter (16 Benjamin Road, Fynnlands, Durban, 4052; tel. no. 031-4662002) to obtain copies or more information. Please send the correct amount with your order. Cheques must be made out to "The Cycad Society of Southern Africa".

VORIGE UITGAWES VAN ENCEPHALARTOS

Eksemplare van alle vorige uitgawes van ENCEPHALARTOS is nog beskikbaar aan nuwe lede wat hulle versamelings wil voltooi, of aan enigiemand anders wat mag belangstel. Die eksemplare kan verkry word teen 'n prys van R5,00 elk vir plaaslike en ander Afrika-lede, en R10,00 elk vir oorsese lede. Die oorsese prys sluit lugposgeld in (wat byvoorbeeld tans meer as R5,00 na Australië beloop). Tree asseblief in verbinding met ons Vorige Uitgawes-beampte, Roy Shooter (Benjaminweg 16, Fynnlands, Durban, 4052; tel. no. 031-4662002) om eksemplare of meer inligting te bekom. Stuur asseblief die korrekte bedrag saam met u bestelling. Tjeks moet aan "Die Broodboomvereniging van Suidelike Afrika" uitgemaak word.

DURBAN MUSEUM CENTENARY

As part of the Durban Museum's Centenary programme, a cocktail party was held on 3 December 1987 to serve the twin purposes of launching Douglas Goode's cycad posters and to view the new video, "Mirror to Museum". An attractive display of cycad plants, supplied by Johan Bodenstein, complemented the poster display. The Society's journals formed part of the exhibit. Society President, Roy Osborne, Natal Chairman, Danie Nel, and several other members were among the some 100 invited guests and dignataries. Speaking at the function, Prof. Waldo Meester, Head of the Biology Department at the University of Natal, emphasized the role of research in biology, particularly with reference to the work of the museum staff.

RARE CONING

Cycad-oreintated visitors to the Durban Botanical Gardens in January this year were delighted to see the first known coning of Encephalartos chimanimaniensis in the gardens. The jade-green coloration and the striking geometry of the male cone scales drew comments from many visitors.

Male cone of E. chimanimaniensis

Clusters of Cycas thouarsii seeds

POLLINATION SUCCESS

Horticulturists at the Durban campus of the University of Natal, in collaboration with our Society, have produced a massive crop of seed of Cycas thouarsii through artificial pollination. The pollen was applied in dry form at weekly intervals over an eight-week period, and part of the resulting crop is shown in the accompanying photograph. The seeds will be used by the University's nursery to increase their stock for further plantings. A proportion of the seeds will be donated to the Society's seed bank.

CROCODILE CYDAD

Joe Perner of Katherine, Northern Territory, Australia has also reacted to our enquiry concerning the cycad which features in a scene in the film "Crocodile Dundee" (see ENCEPHALARTOS no. 10 page 29). He is of the opinion that it is a Cycas armstrongii which is not growing in its natural habitat, however. This species normally grows in sandy, stony soils and not in low-lying waterlogged areas which are susceptable to flooding. He suggests that the plant may have been transplanted by the film company for effect. (See also ENCEPHALARTOS no. 11, page 13).

GEDULD ASSEBLIEF

Lede van die Vereniging en ander lesers word daaraan herinner dat al die ampsraers van die Vereniging hulle bydraes vrywillig, sonder vergoeding en in hulle vrye tyd lewer. Almal van hulle is besige mense wat, net soos u, ook hulle normale beroeps-, gesins- en ander verpligtinge het. U word vriendelik versoek om asseblief geduldig te wees wanneer u wag op 'n antwoord op 'n brief, of op 'n vorige uitgawe van ENEPHALARTOS of op saad van die Saadbank, ens. Onthou, terwyl u besig is om na u eie broodboomversameling om te sien, of om te ontspan, is die ampsdraers dalk besig om hulle tyd op te offer in u belang.

PATIENCE PLEASE

Members of the Society and other readers are reminded that all the office-bearers of the Society make their contributions voluntarily, without remuneration and in their free time. All of them are busy people who, like yourself, have their own normal career, family and other commitments. You are cordially requested to be patient while waiting for a reply to your letter, or for a back copy of ENCEPHALARTOS, or for seed from the Seed Bank, etc. Remember; while you are tending your cycad collection, or are relaxing, the office-bearers may be busy sacrificing their time in your interest.

NURSERY LICENCES

Our attention has been drawn to amendments to the Plant Improvement Act (Act no. 53 of 1976), as published in Government Notices R1387 and R1388 of 26 June 1987. In terms of these amendments, persons growing cycads for sale are no longer required to register their premises as a nursery under the Act, which applies now only to some 27 varieties of fruit trees. Members who intend to operate as nurseries are reminded that the Provincial Nature Conservation legislation is still applicable. Any enquiries in this respect should be directed to the local Nature Conservation Departments.

KWEKERYLISENSIES

Ons aandag is gevestig op wysigings aan die Plantverbeteringswet (Wet no. 53 van 1976), soos gepubliseer in Regeringskennisgewings R1387 en R1388 van 26 Junie 1987. Volgens hierdie wysigings hoef persone wat broodbome vir verkoop kweek, nie langer hulle persele as 'n kwekery onder die Wet te registreer nie. Hierdie vereiste geld nou slegs vir ongeveer 27 soorte vrugtebome. Lede wat beoog om as kwekerye te opereer, word egter daaraan herinner dat die Provinsiale Natuurbewaringswetgewing nog van krag is. Enige navrae in hierdie verband moet aan die plaaslike Natuurbewaringsdepartement gerig word.

TISSUE CULTURE PROJECT

The research project on the tissue culture of cycads, carried out by Roy Osborne and Hannes van Staden of the U.N./C.S.I.R. Research Unit for Plant Growth and Development at the University of Natal, has now been completed. The regeneration of Stangeria from root segments has been mentioned previously (ENCEPHALARTOS no. 9, p 27) and full details have recently been published in a paper in the journal "Hort. Science" of the American Society for Horticultural Science (vol. 22, no. 6, Dec. 1987, p 1326). To the authors' knowledge, this is the only report of a successful "test tube" culture of any African cycad. Unfortunately the procedure is not successful with Encephalartos material. Reprints of the article are available on request from Roy Osborne (20 Maryvale Road, Westville, 3630).

INOPINUS INQUIRY

Member George Norval reports what seems to be a somewhat anomalous seed development in an Encephalartos inopinus cone, and wonders if this is generally true of that species. An apparently normal female cone on an E. inopinus plant in his Westville garden emerged in December 1976. The scales fell and seed was shed in March 1977. The seeds had no fleshy layer, however, and no internal shell of any substance (see photograph). The seeds were thus relatively soft and could be squeezed with only moderate finger pressure.

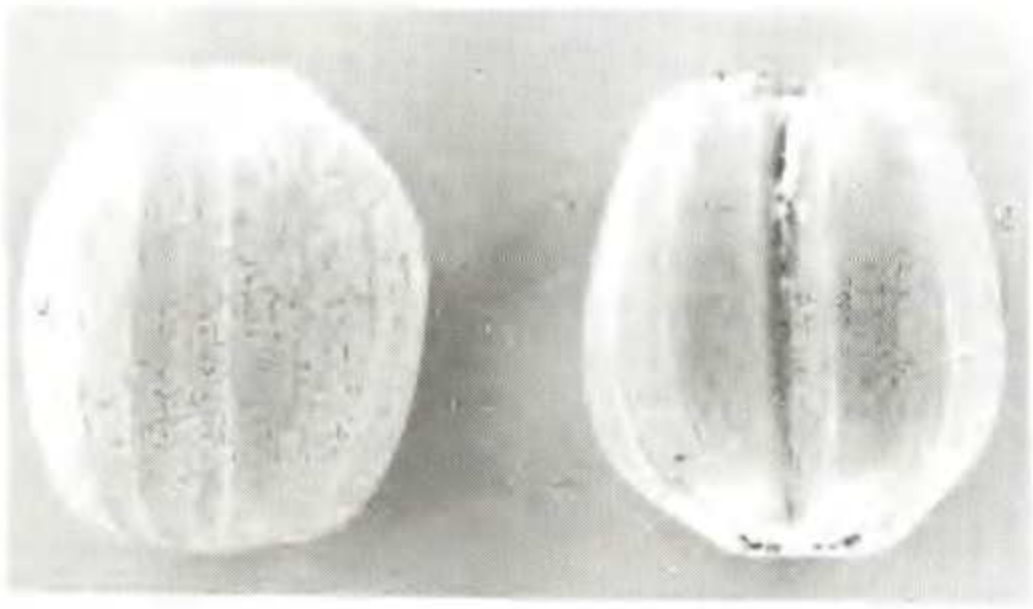
Readers who can enlighten us on seed development in E. inopinus or who have noticed a similar development are invited to write to the Editor.

Female cone of E. inopinus at seed-shedding stage

The E. latifrons specimen which underwent a sex change

TWIN SEEDS

Natal member, George Norval, has drawn our attention to the occasional production of "twin" seeds in Encephalartos. This unusual occurence is shown in the accompanying photograph of two of a total of ten seeds from a cone of E. natalensis which showed this anomaly. Roy Osborne dissected one of these seeds and reports that the seed coat has a prominent longitudinal groove and is easily split at that point. Internally there are two completely separate megagametophytes, closely pressed together, but which seem normal in all respects.



The "twin" E. natalensis seeds

ANOTHER SEX CHANGE

The specimen of Encephalartos latifrons shown in the photograph was transplanted in 1970 in the garden of Bruce and Joan Bursey at Kei Road. The plant bore two successive crops of female cones with viable seed. Following a severe drought at the end of 1983, the plant produced two successive crops of male cones. (Photograph: Roy Osborne)

BOTHALIA REPRINT

Due to potential demand, Erwin Schroeder (P.O. Box 492, Godwana, 1209; tel. no. 01318-54033(H), 54111(W)) is investigating the possibility of a reprint of "The Cycads of Southern Africa" by R.A. Dyer in BOTHALIA, volume 8, part 4, 1965. In order to fulfill this task, he needs an indication of the demand. Persons who would be interested in buying such a reprint, are requested to let Erwin know by the end of May how many copies they would buy. The idea is that the new edition will be revised and made more attractive.

LETTERS BRIEWE LETTERS BRIEWE

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.

Dear Sir

Each issue of ENCEPHALARTOS carries valuable information about cycads. The published articles written by professional scientists who specialize in cycads are valuable but those written by amateur lovers of cycads are often of greater interest. Indeed, I find that some of them, like Cynthia Giddy, have in the course of time turned better than professionals. In this connection the information which your issues give about the search for newly-discovered cycads, about cycads which have been lately rediscovered or about the geographical distribution of various species of cycads in different countries of Africa and South America is most valuable. However, your issues of ENCEPHALARTOS also abound in giving new information or sometimes strange tit-bits about these interesting plants in all parts of the world. To add to this are the excellent photographic illustrations, drawings, etc. which your issues bring to the readers every time.

I for one have gained a great deal from the issues of ENCEPHALARTOS which have been so kindly sent to me. I may add that, like savoury dishes served in small amounts, they leave my mouth watering and, like Oliver, I must continue to ask for more and I thank you in anticipation.

May I also use this opportunity to tell you about something which I think cycad societies and their members in South Africa, U.S.A., Australia, etc. have not been doing so far and which would be very desirable. This, I think, should consist of a programme for the dissemination of seeds and plants of the group to deserving lovers of cycads living in various parts of the world where they do not grow. Man must try to remedy the mistakes and partiality of Nature. Cycads are facing extinction because many of them are endemics and we should not only try to protect them in their natural habitats but also, as far as possible, spread them for the survival of these plants which are unfit for growth in many parts of the world, and for creating interest in them. This in fact calls to my mind the plants of the groups which were flourishing in Antarctica and Greenland during the Triassic and those of modern genera which were growing in Alaska as late as the Tertiary. Even with their physiological limitations, we can try to spread them far and wide and grow them under protection. I for one would like to have living cycads from all parts of the world for cultivation in India in a cycad garden which I am trying to raise in Allahabad. I need the help of cycadologists for realizing this dream and would be ready to give all I can afford to similar efforts in other parts of the world. Unlike politics, which distinguishes nations and prospers in dissentions and differences, science overlooks differences and advances by the unity of all the people of the world.

With best wishes for greater achievements in 1988 and years to come.

Prof. Divya Darshan Pant
University of Allahabad
106, Tagore Town
ALLAHABAD - 211002
INDIA

Dear Sir

The arrival in the mail of the publication, ENCEPHALARTOS, is a looked-for event and always provides a pleasant interruption of more mundane chores. I enjoy it very much.

I was particularly interested in a letter form Mr Van der Merwe in the December 1987 issue, in which he raises some questions about cycad hybridization experiments. I have done some hybridizations myself and am aware, I think, both of the hazards as well as possible rewards in such work.

It is somewhat difficult to compare "within-species" hybrids, such as those of pedigreed dogs, with inter-specific and inter-generic hybrids, such as Piet Vorster mentioned in his article in ENCEPHALARTOS no. 10, or those done by C.J. Chamberlain in the 20's. These cycad genera and species are quite separate entities and are not "varieties" as Mr Van der Merwe implies. Therefore they are not really comparable with bulldogs and collies, which are indeed varieties of one species, although they are, after all, quite different from their wild dog ancestors. I suppose the equivalent among cycads would be the "blue" types one finds among certain species of Encephalartos and Macrozamia.

Regarding the threat to native species, there may be a problem. I imagine a maize geneticist probably would not consider hybrid maize as a threat to its wild ancestors because its genes were all "wild" in the first place and Nature herself, no doubt, had made all of the possible crosses many times over. Furthermore, Nature, by selection, tends to "weed" out most of the disadvantageous crosses, particularly wide crosses between distant relatives. On the other hand, the practice of collecting wild plants, often from far-distant areas, and bringing them together in one place, does run the risk of producing the kind of monsters referred to by Mr Van der Merwe.

I think one must expect hybrids to be attempted by many horticulturalists and plant fanciers, simply because of curiosity if for no other reason. There may possibly be as many hybrid orchids in the hands of orchid fanciers as there are wild types. I doubt that these hybrids are a threat to any wild populations of orchids, although the possibility cannot be ruled out completely. I would have said the same thing about cycads except that I think there could be a threat of wild population contamination in some cases, so we must be careful. By and large, however, wide crosses in cycads seem not to work, but crosses between apparently closely-related species may well produce hybrids. One such, Zamia spartea X Z. furfuracea, which I made in 1979, is perfectly fertile and produced 44 true hybrids of exceptional vigour. The second generation progeny of these hybrids show great variability, ranging in appearance between both grandparental types, but not reaching the extremes (Z. spartea has very narrow leaflets while Z. furfuracea has very broad pinnae, and other characters also differentiate them). Because of the intergradations, I infer that there are a number of gene differerences separating the species. This, I think is worth knowing from the taxonomic-evolutionary viewpoint. In fact, Bart Schutzman believes the Z. spartea X Z. furfuracea hybrid furnishes valuable information regarding certain "hybrid swarms" occurring in the wild at adjacent margins of regions occupied by the two original species. In addition, the spartea/furfuracea hybrid closely resembles a third wild species, Zamia loddigesii which could originally have been a hybrid. In this particular case, my hybrids pose no genetic threat to the wild species because they are so distant from the wild species in their Mexican and Central American habitats.

At Fairchild Tropical Garden, we sometimes receive "gifts" of plants said to be hybrids of this and that species. We usually do not provide space for such donations because we seldom are told precisely what they are. They may well be worthwhile hybrids, and it certainly is possible that such plants occasionally find their way into the trade. I suppose they would be the equivalent of Van der Merwe's "Frankie" and, like Frankie, it also is possible that the scrub cycad may display all the positive virtues of mongreldom, namely toughness, vigour and often rare beauty. My hybrids mature in about three years, much more rapidly than do the wild species. If bona fide crosses of certain species of other cycads can produce fine-looking and rapidly matur-

ing plants for the nursery trade, I would think it might be advantageous. Possibly it would take away some of the pressures now placed on wild cycad populations.

Animal breeders depend as much on certificates and documents as they do upon the eye, and that can be true for cycads also. I would encourage all cycad growers to insist on documentation of their specimens. Where did the plant originate and, if reared from seed, what were the pedigrees of the parents? At Fairchild Tropical Garden all our specimens are documented. Wild species of cycads are far from uniform and a practiced eye may not always suffice to distinguish one species from another, therefore knowing the source, even back a generation or two, may be helpful in knowing what plant one has.

Knut J. Norstog
Fairchild Tropical Garden
MIAMI, FLORIDA, U.S.A.

Sir

With reference to Mr Jack van der Merwe's letter in ENCEPHALARTOS no. 12, page 28: I think Mr van der Merwe misunderstands the issue. The purpose of the hybridization excercise is twofold: firstly, hybrids tell us a lot about the inter-relationships between plants - a matter of great scientific importance. Secondly, the number of Encephalartos species, i.e. collectibles, is limited. By careful hybridization, the probability exists of breeding a plant to fill a certain landscaping need, or even of getting a plant unlike those in other peoples' collections. This is not a harmful excercise. Very few of our members successfully grow cycads from seed pollinated by themselves. Most of these garden seedlings are suspect anyway because insects carry unwanted pollen to the female cones. There is definitely no merit in considering transplanting seedlings from backyard nurseries back into nature.

Certainly unwanted hybrid plants may land on the compost heap. Aloe breeders estimate that they discard at least 90% of their seedlings once these have flowered and have proved disappointing. This does not really matter, because the number of plants destroyed will be extremely small compared to the number of seeds going to waste in gardens because no-one bothered to pollinate the cones. The only one to be any poorer would be the hybridizer who has wasted so much time, but that is his own concern. In practice these unwanted hybrids may indeed land on the market as "no-name" plants. Again, this does not matter, because no serious collector would waste his time with them. We all know how many people pester us for plants, simply because they have heard somewhere that cycads are rare and desirable. Such persons are not really interested and do not deserve anything rare - thus no-name hybrids are ideal for their purpose.
Piet Vorster
STELLENBOSCH

Dear Sir

I am currently doing research on weevil predation of cycad seeds and would appreciate help from members of the Cycad Society. The aim of my research is to examine the extent of weevil predation in different species of Encephalartos, the associations between weevil species and cycad species, and the chemistry of cycad cones with regard to attracting or repelling weevils. I am examining these aspects of weevil-cycad relationships at Kirstenbosch National Botanic Gardens, but require material from further afield.

The sort of assistance I require is:
1) For cycad growers to send me seeds infested with weevils (if seeds are dropped into water, infested seeds usually float).
2) For growers to provide information on which species of cycads are preferentially attacked by weevils in their area, and
3) Seeds in various stages of development so that their chemical constituents can be analyzed.

If any of your readers are prepared to help me, I would greatly appreciate their assistance.

John Donaldson
Endangered Plant Laboratory
Kirstenbosch Botanic Gardens
Private Bag X7
CLAREMONT 7735
Tel. no. 021-771166

GIVE AND TAKE GEE EN NEEM

- Don Giese (8 Nico Malan Drive, King William's Town, 5600; tel. no. 0433-22628) has a large cycad collection for sale. It consists of all the South African Encephalartos species (including E. woodii), three other African Encephalartos species and two popular foreign species - a total of 131 plants, up to 1 m tall. They are growing in his nursery, are well cared for and in a very healthy condition. The price is R40 000. The plants are being sold under permit number 274/1987 of the Cape Nature Conservation Department, which is valid until 3 September 1988.

- Guy Wrinkle (11610 Addison Street, North Hollywood, California 91601, U.S.A.) is looking for Encephalartos seed to buy or exchange. Anyone who can help him, must advise him of species available and price. He has seed of various species, including Dioon edule, Zamia furfuracea and Cycas revoluta.

- Alan Sonnenberg (1 Windsor Road, Rondebosch East, Cape Town 7780; tel. no. 021-6961609) would like to obtain seeds or plants of Encephalartos chimanimaniensis, E. inopinus and E. cupidus.

- Erwin Schroeder (P.O. Box 492, Godwana, 1209; tel. no. 01318 - 54033(H), 54111(W)) is looking for information on Encephalartos hybrids. He would like to publish a booklet on hybrids, with descriptions and photographs. Photographs showing cone and leaf detail, as well as a description of the plant, would be especially appreciated. If it is a natural hybrid, information on its area of origin would also be important. Should it be impossible to send photographs, portions of a leaf (top, middle, bottom) as well as cone scales would be welcome. Erwin also has seed of E. natalensis for sale or swop.

- Prof. Nat Grobbelaar (Department of Botany, University of Pretoria, 0002) is anxious to make contact with any member who may be able to supply a small amount of pollen from Encephalartos ghellinckii and E. heenanii. This will allow completion of a full electron-microscopic survey of pollen of all the South African species.

- Member N.J. Kachelhoffer (P.O.Box 3107, Pretoria, 0001; tel.no. 012-219375 or 462780) is interested in buying about 500 seeds of each indigenous cycad species.

- Mr Bill Gaynor (4 Haig Road, Attadale 6156, Western Australia) is trying to build up a collection of five or six specimens of all available cycad species. He would sincerely appreciate seeds of the following South African species: Encephalartos eugene-maraisii, E. inopinus, E. lehmannii, E. paucidentatus and E. transvenosus.

- Joe Perner (16 Stutterd Street, Katherine, N.T. 5780, Northern Territory, Australia) would like to purchase seedlings of the rarer South African and Central African cycads, including Encephalartos woodii. He is also prepared to swop plants and has various Cycas, Macrozamia and Bowenia species available. The necessary permits would obviously be required.

- Roy Osborne (20 Maryvale Road, Westville, 3630; tel.no. 031-866953) is preparing texts for the "Focus On" series, covering Encephalartos barteri and E. lebomboensis, the latter including the form known as "var. Piet Retiefii". Any members who can contribute information and/or photographs to illustrate these two species, are requested to contact Roy.

The Cycad Society Of Southern Africa

Die Broodboomvereniging Van Suidelike Afrika

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