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CYCAD SOCIETY OF SOUTH AFRICA

BROODBOOM VERENIGING VAN SUID-AFRIKA

www.cycadsociety.org

Contact: cycad@cycadsociety.org

COUNCIL MEMBERS / RAADSLEDE

President

Xander de Kock
P.O. Box/Posbus 21
Faunapark 0787
Tel./Fax: 015 291 1381
Cell/Sel.: 082 465 8432
E-mail/E-pos: xanvet@netactive.co.za

Editor of Encephalartos/ Redakteur van Encephalartos

Wynand van Eeden
P.O. Box/Posbus 3489
Tygerpark 7536
E-mail/E-pos: wynand@ananzi.co.za

Secretary-treasurer/Sekretaris-tesourier Back copies officer/Beampte vir vorige uitgawes

Ian Bassingthwaight
P.O. Box/Posbus 176
Montana Park 0159
Tel.: 012 548 1152
Fax: 086 678 9807
E-mail/E-pos: cycad@cycadsociety.org

Co-opted member (webmaster)/ Gekoöpteerde lid (webmeester)

Pieter van der Walt
P.O. Box/Posbus 913
Olivedale 2158
E-mail/E-pos: pvdwalt@hotmail.com

REGIONAL BRANCH REPRESENTATIVES/STREEKTAKVERTEENWOORDIGERS

Limpopo

Piet de Bruyn
P.O. Box/Posbus 3896
Mokopane 0600
Cell/Sel.: 083 447 5979

Western Cape/Wes-Kaap

Frikkie Conradie
Cell/Sel.: 084 951 0550
E-mail/E-pos: heksiewp@telkomsa.net

Lowveld/Laeveld

Dirk van der Walt
Cell/Sel.: 082 557 0943
E-mail/E-pos: vanderwaltD@tsb.co.za

KwaZulu-Natal

Danie Nel
P.O. Box/Posbus 45
Umlaas Road 3730
Tel.: 033 251 0478
Cell/Sel.: 082 925 4540 or 082 924 6969
E-mail/E-pos: cycadcenter@mweb.co.za

Eastern Cape/Oos-Kaap

Marius Helm
P.O. Box/Posbus 2296
Komani 5320
Tel.: 082 807 1029
Fax: 045 838 3544
E-mail/E-pos: mhelm@vodamail.co.za

Central (Transvaal)

John Evert
P.O. Box/Posbus 13170
Leraatsfontein 1038
082 444 1354 or 013 697 0327
E-mail/E-pos: cycads@webmail.co.za

OVERSEAS CORRESPONDENTS/BUITELANDSE SKAKELBEAMPTES

Australia

Paul Kennedy
21 Sierra Road, Engadine
New South Wales 2233
Tel.: 02 9520 7690
E-mail/E-pos: cycads@awwwesome.com.au

USA and Canada

Willie Tang
65 Corydon Drive, Miami Springs
Florida 33166
Tel.: 305 667 1651
E-mail/E-pos: wlmtang@bellsouth.net

POLLEN AND SEEDBANK OFFICERS/STUIFMEEL- EN SAADBANKBEAMPTES

Central (Transvaal)

Richard Potter
P.O. Box 714
Paulshof 2056
Cell/Sel: 073 432 0021
Fax/Faks: 086 535 0882
E-mail/E-pos: 0734320021@ mtnloaded.co.za

KwaZulu-Natal

Vakant / Vacant

Lowveld/Laeveld

Robert Kunitz
Cell/Sel.: 082 808 5721
E-mail/E-pos: rob@waytogrow.co.za

Limpopo and countrywide/Limpopo en landswyd

Diekie de Klerk
P.O. Box/Posbus 2234
Polokwane 0700
Tel.: 015 297 3196/7
Cell/Sel.: 083 292 4310
Fax/Faks.: 015 297 4627
E-mail/E-pos: deklerkk@mweb.co.za

Western Cape /Wes-Kaap

Vakant / Vacant

On the cover:

Roy Osborne with *Macrozamia moorei* at Springsure, Australia.

CONTENTS

From the president/Van die president —X. de Kock	2
From the council/Van die raad	
Survivors in our society	3
Encephalartos no. 100 – A milestone to celebrate—R. Osborne & I. Bassingthwaighte	11
Heroes of the society	15
New members	17
The cycads of the Kabouga Area of the Addo National Park.	17
Uitstappie na Suid-Kaap, George en Gouritzrivier: 21 tot 23 mei 2010. / Excursion to the Southern Cape: George and Gouritz river: 21 to 22 may, 2010—F. Conradie.	25
Focus on <i>Ceratozamia mexicana</i> Brongn. —R. Osborne & A.P. Vovides.	29
Articles/Artikels	
An Account of Eastern Cape Cycads in Habitat—A. Tait	35
A trip to the habitat of <i>Encephalartos longifolius</i> —A.J. Cilliers & E.H. Berry	44
A Molecular Phylogeny of <i>Encephalartos</i> : Early findings—P. Rousseau	46
Receptivity in female <i>Cycas</i> cones—W. Tang	48
PSST - GOT ANY DIRTY CYCADS?—R. Osborne	50
Letters/Briewe	51

Errata

Due to a technical problem a number of spelling mistakes appeared in the specific epithets of some species in *ENCEPHALARTOS* No 99.

In the “New Publications” article on page 13, *Cycas dentata* is incorrectly referred to as *Cycas edentate*.

In the article “Cycads of the World for the Layman” on page 27, *Cycas aculeata* is referred to as *Cycas aculete*, *C. thouarsii* as *C. thousii*, *C. revoluta* as *C. revolute*, *C. truncata* as *C. truncate*, *Dioon caputoi* as *Dioon capitoi*, *Encephalartos barteri* as *Encephalartos bateri*, *Zamia obliqua* as *Zamia oblique*, *Z. oreillyi* as *Z. oreilly* and *Z. vazquezii* as *Z. vazquesii*.

Disclaimer

The Cycad Society of South Africa, editor and board members, and authors of articles cannot be held responsible for errors or consequences arising from the use of information contained in *ENCEPHALARTOS*. The views and opinions expressed do not necessarily reflect those of the Cycad Society, editor, and board. The publications of advertisements do not necessarily constitute any endorsement by the Cycad Society, editor, and board of the products advertised.

Dit is vir my 'n voereg om hierdie artikel in die 100ste uitgawe van ENCEPHALARTOS te skryf. Hierdie mylpaal is te danke aan baie individue, hopeloos te veel om te noem, maar ek gaan melding maak van wyle Maans Kemp vir die eerste en Wynand van Eeden vir hierdie uitgawe. Die redakteur van enige publikasie, sit baie ure se werk in en is afhanklik van bydraes deur lede. Vir die gereelde skrywers soos Roy Osborne, wat feitlik vir elke uitgawe bydraes lewer, en andere wil ek net sê, baie dankie.

In die uitgawe is daar 'n kopie van die nuwe grondwet vir goedkeuring deur die lede deur middel van 'n stembrief. Hierdie is die resultaat van baie ure se werk wat begin is deur Prof. Nat Grobbelaar met die voorstel vir 'n paar wysigings in 2007 tot die herskryf van die hele grondwet deur Jaap Viljoen in 2008. Daarna is dit verskeie kere geredigeer en vertaal om die finale produk aan julle te lewer en ek wil almal bedank vir hul insette. Die verlenging van die dienstermyn van Raadslede en streeksbesture tot 3 jaar, proporsionele streeksverteenvoording volgens ledetal en die daarstel van 'n dissiplinêre proses is van die hoof wysigings. Lede moet asseblief die nodige stembrief voltooi en aan die Sekretaris stuur voor 15 Augustus 2010. As die meerderheid dit goedkeur, sal die kopie as jul finale persoonlike kopie funksioneer.

In die volgende paar maande gaan daar heelwat verkopings van broodbome plaas vind. Dit sal baie interessant wees om te sien wat die aanvraag vir plante in die huidige ekonomie is. Ons lede is besig om al die spesies, insluitende die skaarser soorte, in hul duisende te produseer. Dit wil tog voorkom asof die skaarser plante net duurder word. Ek sou die teenoorgestelde verwag het of is dit 'n geval dat die skaarser soorte ten duurste uitgevoer word vir dollar's of word die mark gereguleer deur beperkte hoeveelhede saailinge beskikbaar te stel! Ek kan verstaan dat volwasse plante van veral die skaarser soorte duurder word, omdat daar net 'n beperkte aantal van sodanige plante in wettige besit is. Dit is soos die spreekwoordelike huisie by die see!

Hierdie massa produksie van saailinge deur ons lede is uitstekend in die lig dat die owerhede geen poging aanwend om dieselfde te doen met plante in die natuur en onder hul toesig nie. Die ontwikkeling van die "bar-coding" tegnologie lyk moeiliker te wees en gevolglik stadiger as wat aanvanklik gehoop is. Miskien sal ons in die toekoms hierdie tegnologie kan gebruik om die skaarses spesies se identiteit suiwer te hou vir ons nageslag, wie weet, en dalk weer hervestig!

Groete
Xander de Kock

It's a privilege to write this article for the 100th issue of ENCEPHALARTOS. This accomplishment is thanks to many individuals, to many to mention, but I would like to thank late Maans Kemp for the first and Wynand van Eeden for this issue. The Editor's, past and present, spend hours on end over the years to produce our magazine, the ENCEPHALARTOS. This would not have been possible without the input of our members and regular contributors like Roy Osborne, who contributed to almost all issues. Thanks everyone!

The final draft of the constitution is available in this issue for your approval. This is the result of a process that was started by Prof. Nat Grobbelaar in 2007 with a few amendments and a complete rewrite by Jaap Viljoen in 2008/09. Since then it has been edited several times and translated with the final draft available at last. The major changes are the term of office that increases from 2 to 3 years, proportional representation (increased votes) on the Board for regions according to membership, different membership classes and a disciplinary process. To finalize and approve this process, members must please complete the voting card and send it to the Secretary to reach him before 15th August 2010. If this final draft is approved by a majority this draft will function as your copy of the Constitution.

In the next few months several cycad auctions and sales will be hold all over South Africa. It would be very interesting to see what the demand for cycads will be in the current economic climate. Our members are producing Encephalartos seedlings in their thousands, including the rarer species, but the latter seems to be getting just more expensive. One would have expected the opposite or is it a case of them being exported for dollars or limited numbers being made available to keep the price artificially high! I can understand the prize value of mature legal cycads, especially the rare, of which only a limited number are available. It is like a property with direct access to the ocean!

This mass production of cycads by our members is very positive in the light of South African nature conservators' inability to manage our natural populations and cycads in their care. The South African Government is very pro the sustainable usage of a natural resource, but nothing is done in this regard with cycads. The development of the "bar-coding" technology seems to be more difficult and slower than initially expected. Hopefully this technology will be functional and available in the nearby future to keep the rare cycads pure for generations to come and even reintroduction into nature!

Regards
Xander de Kock

SURVIVORS IN OUR SOCIETY

One of the enduring mysteries of the Society is the attrition of our members. Currently we have 988 members, but ever since 1996 our membership has stayed relatively constant at between 800 and the current 988 (which admittedly, is the highest ever). Yet our membership numbers have now passed 3700, which means that of the 3700+ members who joined over the years, only 37% are still with us. What happened to the rest? People do get old and die, people do move to places where cycads won't grow, and (dare we say it?) people do sell their plants and move on to other interests. Still, the rate of attrition seems unacceptably high to us.

One group of members where a certain degree of attrition can be expected, is that comprising our first 100 members. By the time *ENCEPHALARTOS* no. 1 appeared in March 1985 we already had 136 members. In those early days many of our members were people who had for years been playing with cycads on their own, i.e. no longer youngsters; and today they would be a quarter of a century older. Yet 15 of those first 100 members are still with us, i.e. 30%, which compares very favourably with the records for all the following years. We submit that these pioneers were unusually enthusiastic and dependable. They are people to whom we can look up, and surely we can still learn a lot from them, not only from their knowledge and experience, but also from their continuing support of the Society and our aims. Here they are, and here are their stories as told mostly by themselves:

(8) Edgar Wohlberg

I have always been interested in nature and plants. My first hobby when I was stationed in Colenso was *Lithops* and I built up a big collection. After 4 years I was

transferred to Durban where these plants did not survive. We bought a house which had just been built and I had to organize a garden. I was given suckers of *Cycas revoluta* and *Cycas thouarsii* which set me off on the cycad path.



Figure 1.—: Edgar Wohlberg as sketched by Dennis Lapham during the 1996 journey to China.



Figure 2.—: Edgar Wohlberg with the now extinct in nature "Umtamvuna" *Encephalartos laevifolius*

Shortly afterwards I met Roy Osborne as well as Danie and Avis Nel, and the growing of plants from seeds started. Douglas Goode was also at that time collecting information for his book and he used to come and collect material in our garden. He gave me a few seeds sent to him by Botanical Gardens from African countries.

I have been a pensioner for 18 years and I am going through a dormant phase. I am enjoying the cycads in our garden and have also planted many in the gardens of our children.

Highlights in my involvement with cycads include the translocation of the severely threatened "Umtamvuna" *Encephalartos laevifolius*, where I organized a helicopter to lift the plants out of the gorge. Another lifetime experience was attending the CYCAD '96 conference in China.

(12) Roy Osborne

Founder and first President of our Society, I have been studying cycads for more than 40 years. Born in England, I spent my schooldays in Port Elizabeth before attending Rhodes University in Grahamstown and later the University of Natal in Durban, where I obtained masters and doctor's degrees for my work on cycad chemistry, biochemistry, and tissue culture. Now living in Queensland, Australia, I have published numerous cycad oriented articles and scientific papers and is the co-author of *Cycads of Australia*, *Cycads of Vietnam*. Presently I am working on a definitive volume of *Cycads of Mexico*.



Figure 3.—: Roy Osborne admiring *Dioon merolae* in Stan Walkley's nursery near Brisbane, Australia. Photo: Stan Walkley.

[Roy is very reticent about himself, but his contributions to *ENCEPHALARTOS*, to cycad literature in general, and to the promotion of the Society and cycadology speak for themselves. Surprisingly he is not a great collector of cycads, having almost none in his garden in Brisbane. Instead he collects and collates vast amounts of information on cycads, which are freely shared with the cycadophile community. See also *Heroes of the Society* in this issue. - Editor]

(16) Piet Vorster

I spent my first three years in an apartment within sight of the Union Buildings in Pretoria. On Sundays I was taken there in my push cart while my parents admired the glorious view over the city, but also the beautiful plantings of indigenous plants. My mother was always interested in plants, and years later she told me about the interesting cycads in that garden. I eventually cycled in to see them first-hand, and immediately fell to their charm. When I got to university, my chaotic interests were given direction by the fine botanic garden surrounding the botany building, and my teachers including Prof. Manie van der Schijff, Hannes Robbertse, and Isabella Claassen made sure that the lessons stuck.

In those days I was bent on re-writing the *Systema naturae*, and field trips was the way to do it. On a trip to Swaziland I visited a farm where a large *Encephalartos senticosus* grew next to the driveway, and seeds were germinating on the surface of the driveway. Of those I gathered 73. Today I have only one of the resulting seedlings



Figure 4.—: Piet Vorster preparing herbarium specimens while on a field trip in eastern Zimbabwe.

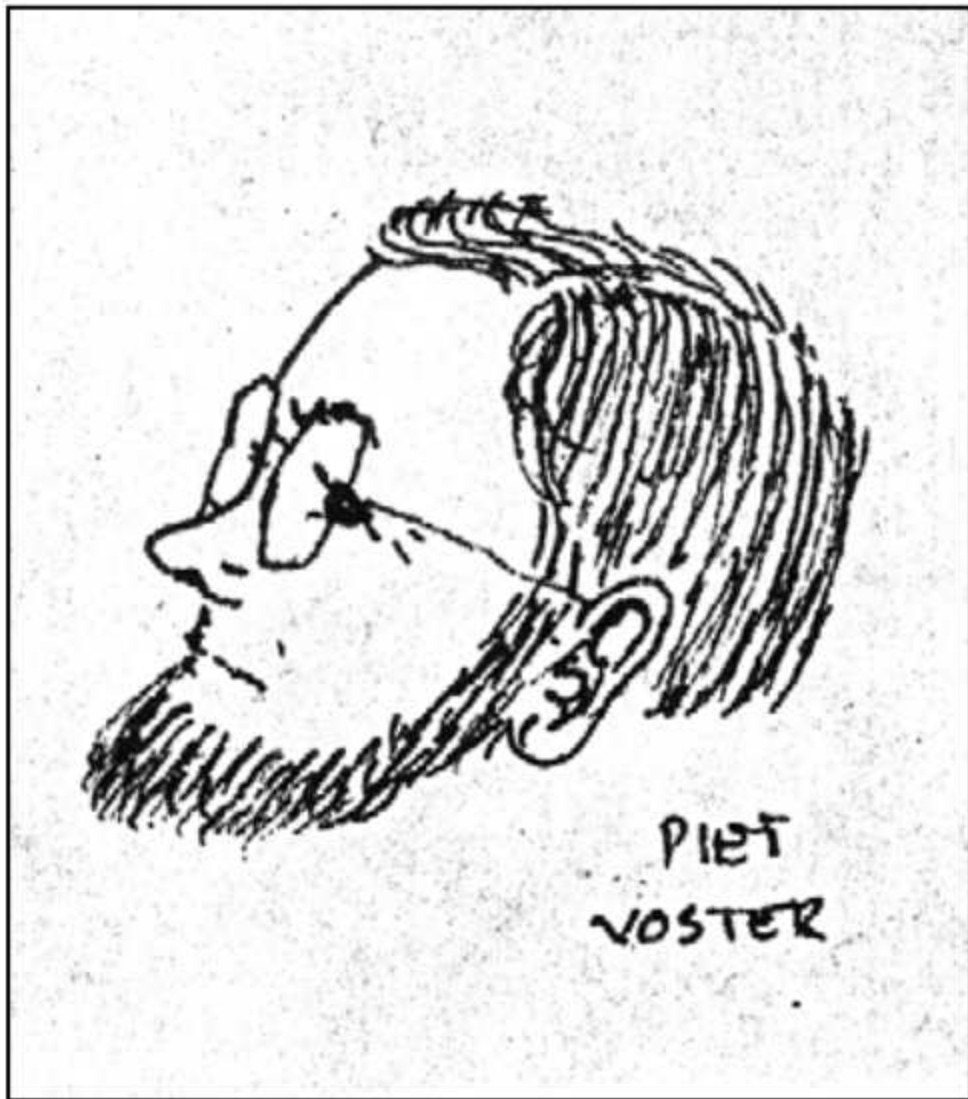


Figure 5.—: Piet Vorster as sketched by Dennis Lapham during the 1996 journey to China.

left, but the rest went all over the world in exchange for what became the nucleus of my collection. My advice to new collectors is to get together as many seeds and seedlings common species as you can, grow them on, and swop them for other species. I myself have on occasion given 30 or more seedlings in exchange for a desirable plant. Also, be free with your surplus material. I have given away hundreds of plants without expecting anything in return, and I have received as gifts very many really interesting plants and seeds. The result was that I spent very little money on purchasing plants; and I can literally count on one hand's fingers the number of plants which I bought.

I am now retired from the University of Stellenbosch where I worked as plant taxonomist on plant groups including *Perlargonium*, the Amaryllidaceae, and of course cycads. I am still doing botany, mainly sorting and writing up the vast amount of data collected over the years. The only difference is that I no longer get a salary, and that I don't have to attend staff meetings and write reports.

The greatest highlights of my involvement with cycads was, and remains, to experience cycads in their natural settings. It is also something special when a treasured seed germinates, sometimes after more than a year in the seed bed.

(24) Leon Pienaar

Die broodboom-bosluis het my gebyt, en ek het begin versamel. My hele versameling, behalwe twee plante wat terloops nie besonder mooi is nie, het ek verkry van sade, saailinge, en suiers. Toevallig is twee groter plante waarmee ek begin het, nie so baie mooi nie, vanweë hulle onaansienlike stamme. Ek moet erken dat ek van nature 'n versamelaar is, en hou nou nog aan om broodbome te versamel. Voor ek begin het om broodbome te koop, het ek Cynthia Giddy se boek deeglik bestudeer. Na my eerste aankoop, het ek vasgestel wie die prominente versamelaars van destyds was, en met hulle vriende gemaak. In 1982

het ek gehoor van die Hartebeeshoek-kwekery was bedryf is deur die destyds Transvaalse Afdeling Natuurbewaring, waar ek vier saailinge aangekoop het teen R15 stuk.

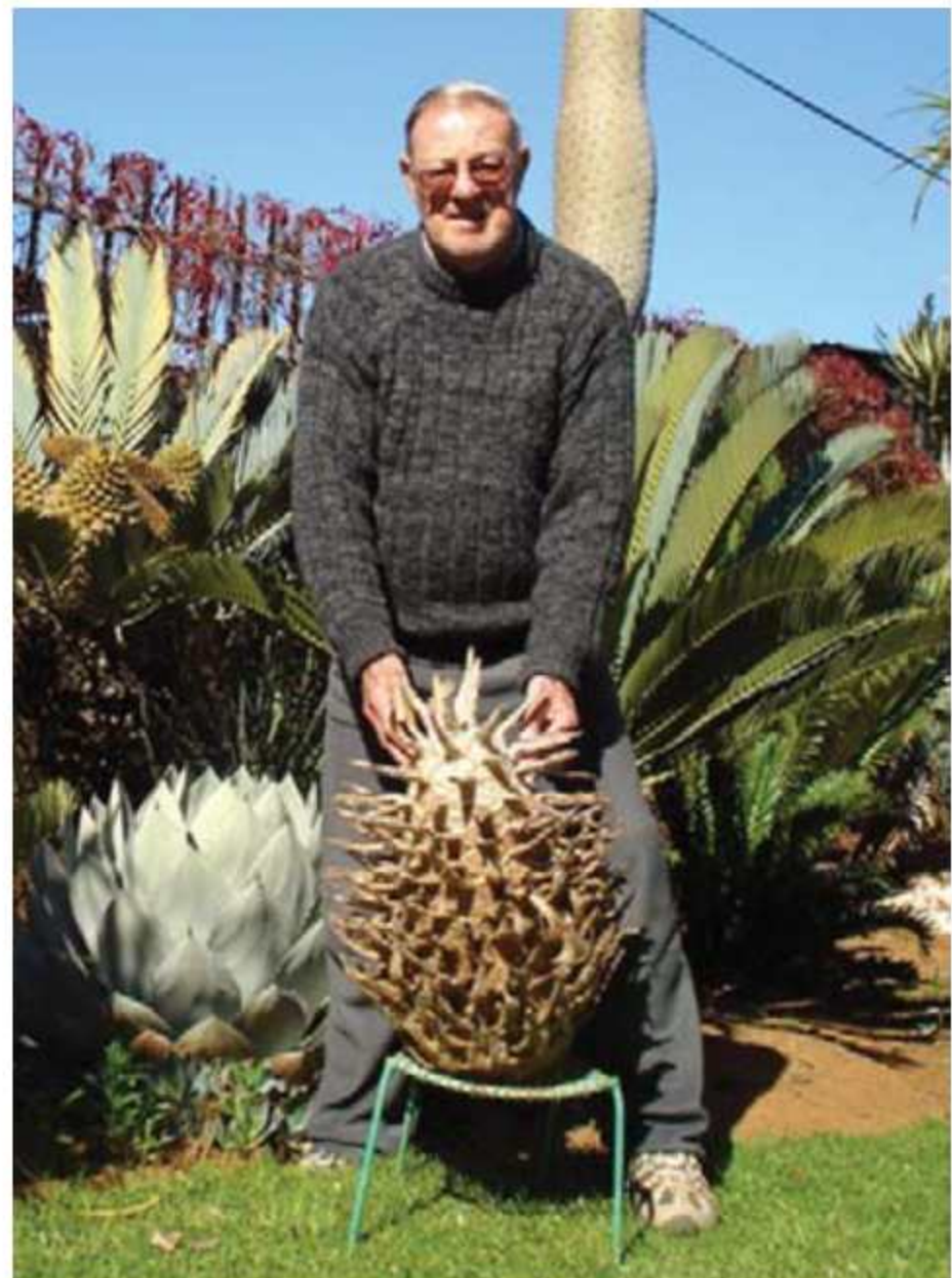
Ek probeer om as die verskillende soorte broodbome van buite Suid-Afrika te bekom. My ervaring is dat, om al die Suid-Afrikaanse soorte in die hande te kry, bloot afhang van hoeveel geld jy beskikbaar het. As iemand vir my 'n onbeperkte bedrag geld beskikbaar sou stel, sal ek skougehalte plante van al die Suid-Afrikaanse soorte (insluitende *Encephalartos brevifoliolatus*) binne een week in die hande kan kry.

Om al Suid-Afrika se soorte (buiten *Encephalartos brevifoliolatus*) te bekom is, in akademiese terme, so maklik as om matriek te verwerf. Om die soorte van die res van Afrika in die hande te kry, is so maklik (of moeilik) as om 'n B-graad aan universiteit te verwerf. Om broodbome van buite Afrika te kry en aan die lewe te hou, is net so maklik as om 'n D-graad in Kwantum Fisika te verwerf.

Soos daar met verloop van tyd boeke oor broodbome beskikbaar geword het, het ek hulle aangeskaf. Nie net in my boekrak gesit nie, maar bestudeer. Vandag het ek op my skryftafel 'n spesiale boekrak, slegs vir broodbome, en gebruik hulle gereëld vir naslaanwerk.

My hoogtepunt is die besef dat ek waarskynlik die meeste verskillende broodboomsoorte in Afrika het.

[Leon is a very serious collector, with only one passion: cycads. He grew practically all his plants from seed, seedlings or suckers. He claims to possess the largest variety of cycas species of any collector in Africa – Editor]



Figuur 6.—: Leon Pienaar met 'n 20 kg vroulike keël van *Dioon californoi* uit sy tuin. Let daarop dat hy ook plante anders as broodbome het.

(47) Stephanus W. Wentzel

We have been unable to contact Stephanus in time for this issue. Currently he lives in Pretoria. – **Editor**

(51) George Walters

I started my cycad collection in 1973 and joined the Cycad Society after my wife heard a talk by Roy Osborne on the radio. As a family we enjoyed many outings with the Natal Regional Branch, and made many friends.

My collection soon built up, mainly from seed distributed by our seedbank, but also through seedling exchange with other members. I also purchased plants from Dennis Heenan (results of the first Heenan expedition to tropical Africa).

In July 2005 I was diagnosed with a brain tumour and donated my entire collection of over 30 years to the Makaranga Gardens at Kloof, formerly the Fern Valley Botanic Gardens, where my son Andrew was the resident Curator Horticulturist. Sadly my son passed away in February 2007 after a short illness.



Figure 7.—: George Walters sometime between 1987 and 1989 with his legendary plant of *Encephalartos whitelockii*, obtained from Dennis Heenan in 1974 when the stem was the size of a football. This awesome plant was inspected in puzzlement by Roy Works, Michael Perry, Byron and Libby Besse, Cynthia Giddy, and Piet Vorster amongst others in the days before *Encephalartos whitelockii* was described. Today it is much larger.



Figure 8.—: *Encephalartos whitelockii*: male cones of the same plant as shown in Figure 1, a few years later.

I still live in Durban, and I still continue to visit the Gardens every week. The entire cycad collection, which is beautifully landscaped, is entrusted to my care, and is now a fitting memorial to my son who was a dedicated horticulturalist.

(60) Dr. & Mrs. R.A. van Rooyen

We have been unable to contact the Van Rooyens in time for this issue. Currently they live in Witrivier. – **Editor**

(71) Ben Visser

We have been unable to contact Ben in time for this issue. Currently he lives in Brits. In 1990 and 1991 he was an office bearer of the Society – **Editor**

(78) Colin Pinker

I first became interested in cycads on a holiday trip to Port Edward, on the South Coast, where the locals were selling stolen *Encephalartos natalensis* on the bridge. My father was aware of these plants and he explained their significance and historical value. From then on, the rest they say is history.

I have built up my collection over the last 27 years with contributions from Danie Nel at the seed bank, seedlings from Roy Osborne, seedlings of numerous species from the Rosslyn Nursery and indeed many other nurseries in the country that were selling cycads. I also purchased three 1 meter long *Encephalartos friderici-guilielmii* and dozens of seeds from Len Forrester. Additionally countless auctions and sales have contributed to my collection. In my backyard I have a small nursery, from where I have cultivated thousands of seedlings.

At this stage I am semi retired, after selling my business three years ago, but I have retained a property portfolio that keeps me relatively busy. Over the last 10 years I have not actively pursued increasing my collection, as



Figure 9.—: Colin Pinker with a magnificent plant of *Encephalartos altensteinii* enjoying the subtropical climate of Nelspruit.

family and business interests took priority. My plans are to travel extensively over the next few years.

My highlight has been to see my plants thrive in the Nelspruit climate.

(80) Jan de Jong

I cannot really remember exactly how I became involved with cycads: it may have been when I had to transfer a 'family heirloom' *Cycas revoluta* from my parent's home to mine when they moved to a smaller house. This three-headed plant is still in my garden, now about two meters tall.

Cycads were mostly bought as seedlings: I recall only buying about 5 plants of any size. Two were from the old OK Bazaars in Randburg, one from the late Len Forrester at Cathcart (an *Encephalartos friderici-guilielmii*), and two *E. longifolius* from a farmer in the Langkloof who was selling plants to keep his farm going during a drought. In those days the old Transvaal Department of Nature Conservation had a nursery in Pretoria North, and in my extensive travels I managed to purchase seedling plants relatively cheaply from Patryshoek at De Wildt, Allesbeste at Tzaneen, Wulwekop Nursery at Mooketsi, Nelspruit Botanical Gardens, Kangwane Nature Conservation near Malelane, Cynthia Giddy, and Danie Nel and Avis Merrisman-when they were still in Durban and then at Cycad Center. Professor Grobbelaar's nursery was also visited. Frequent visits to the University of Pretoria (UP) nursery resulted in me meeting Sussanne Myburgh, where some good plants were bought. Steve Trollip's Bark Enterprises was also the source of some plants. Seeds were bought from Cycad Center, and a business meeting with the late Ewert du Plessis at Skuinsdrift near Groot Marico resulted in me obtaining *E. inopinus* pollen from the University of Pretoria and ultimately obtaining two small seedlings (the University of Pretoria also getting their share).



Figure 10.—: Jan de Jong with an *Encephalartos transvenosus*, beautifully grown in spite of the cold winters on the Witwatersrand.

I am still involved in Agriculture as an Agricultural Economist, which means that I still travel widely, but not as often as in the past.

The highlights of my involvement has been the pleasure of seeing other people's beautiful collections (sometimes wondering how they managed to acquire them), but always coming home to my own small collection and appreciating the privilege of owning these living fossils, most of which are not special or valuable at all.

My favourite of all cycads is *E. ferox*, even though I struggle to keep them alive in my cold and wet garden. The broad, dark green, glossy leaves and colourful cones make this my favorite, followed by *E. arenarius*. The bad frost of late June 2010 was a blow, and hopefully all the exotic cycads will pull through, especially the impressive *Dioon spinulosum* given me by the late Bruce Burse of Lowlands Nursery while on our honeymoon.

May the Cycad Society go from strength to strength, my entire collection of *ENCEPHALARTOS* (including the first two combined Palm Society/ Cycad Society Journals) are valuable sources of research, and their scientific quality unparalleled. Congratulations on 25 years of excellent service to its members, and a heartfelt thank you to all the many people who have done countless hours of work on the journals.

(82) Stef Schoeman en Erica & Neethling du Toit (sy dogter en skoonseun)

Lid nr. 82 was my pa, Stefanus Johannes Schoeman, algemeen bekend as oom Stef. Ons het met sy dood in 1999 sy lidmaatskap oorgeneem.

Hy het in Pretoria-Noord gewoon en het 'n groot versameling broodbome gehad wat hy sedert 1983 opgebou het. Met sy dood is die meeste van die broodbome verkoop. Ons het van die warmer-groeiende broodbome hier na die Laeveld [Nelspruit] gebring maar kon ongelukkig nie die hele versameling uit die boedel koop nie.

As ek reg onthou was daar 'n broodboomtak in Pretoria-Noord en was hy vir 'n tyd lank die voorsitter daarvan. Hy het gewet waar verskillende broodbome in mense se tuine in Pretoria-Noord gestaan het en het baie bestuwing gedoen. Hy was, volgens Tino Ferrero, dan ook een van die min mense wat die volledige stel van *ENCEPHALARTOS* op daardie tydstip gehad het. Hy het die boekies laat bind en die drie gebinde bande is in ons besit. Ons het die eerste uitgawe van Cynthia Giddy se boek gehad voordat hy werklik in die broodbome begin belangstel het. Op daardie tydstip was die boek nie meer in die handel beskikbaar nie en hy het met lang oë na ons boek gekyk en die opmerking gemaak dat hy die boek graag eendag sou wou erf. Dit was kentekenend van sy lus vir die lewe. Dalk werk my pa nou kliphard aan die hemel se broodbome.

[Stef was Chairman of the Eugene Marais Regional Branch from 1988 to 1991. After his death in 1999 his daughter Erica du Toit and her husband, Neethling, took over his membership, some of his plants, and three bound volumes of *ENCEPHALARTOS*. Although Stef is no longer with us, he is probably now tending heavens' cycads, and this membership is a true family affair – Editor]

(85) Ian Dixon

Many years ago, on the coast of Zululand, I came across a magnificent plant growing under a big tree. I learned that this was called *Encephalartos kosiensis* because of its proximity to Kosi Bay. The correct name today is *Encephalartos ferox*, and my collection comprises several young plants as well as some *E. natalensis*, *E. villosus*, *E. ghellinckii*, *E. horridus*, *E. eugene-maraisii*, as well as others including *Cycas revoluta*. In the past we have, from time to time, tried to grow plants from kernels of the cones using various methods, all of which were unsuccessful. Imagine our delight, however, when some of our *R. natalensis* produced quite a lot of seedlings in undisturbed ground where the kernels from cones must have fallen. We have looked after these seedlings and all have grown into good sized plants and given us great pleasure.

I am still a beginner at heart and appreciate what the magazine does in educating and showing us many of the cycad species. I am also grateful to all the members who give their time, effort and skills to serve on committees to promote these fascinating plants.

I am a retired Bank Manager who worked in the banking industry for some 43 years and was transferred fairly frequently, but I managed to keep my small number of plants. My wife June, daughter Lesley and my son in law

Grant are all hooked on cycads and take a keen interest in caring for them, especially when new fronds or cones are showing. We live in Pietermaritzburg.

(94) Louis Olivier

My pa het in 1972 begin om broodbome te versamel. As kinders het ons die voorreg gehad om baie saam te gaan veld-toe om van die plante uit te haal. Op daardie stadium was daar nie baie broodboomversamelaars in die land nie. Hy het baie plante uitgeruil want toe was daar nog nie geld betrokke nie. My pa is skielik aan die begin van 1978 oorlede. Daar was toe heelwat plante in die tuin en is daar nie meer versamel nie.

In die begin van 1982 het wyle Cynthia Giddy ons kom besoek en was daar baie plante wat begin kiel het, onder andere, 'n manlike en vroulike *Encephalartos caffer*. Sy het gevra hoekom ek nie begin om broodbome te kweek nie, en vir my gewys hoe om hulle te bestuif. Die gevolg was dat ek die volgende jaar 'n klompie *E. caffer* saailinge gehad het. My eerste kwekery permit is toe in 1986 uitgereik om broodboomsaailinge te verkoop.

Ek boer tans in die Sondagsriviervallei naby Kirkwood. My grootste plesier is om te sien hoe groot die plante nou al in tuine is, van saad wat ek 'n paar jaar gelede geplant het.



Figure 11.—: Ian Dixon with *Encephalartos eugene-maraisii* at his home in Pietermaritzburg.



Figuur 12.—: Louis Olivier (middel) saam met sy pa en jonger broer voor 'n *Encephalartos lehmannii* wat naby Kirkwood uitgehaal is; lank, lank gelede. Seker is daar vandag op die plaas nog 'n jong oudjie wat broodboompitte plant?



Figuur 13.—: Louis Olivier entoesiasies besig om 'n tweekoppige *Encephalartos princeps* te bestuif.

(96) Ian Turner

I first became interested in cycads when I saw a nice *Cycas revoluta* in Australia in 1962.

When I came home I searched the nurseries for cycads and from then on it just became a big thing in my life to build up my collection. I bought the collection of Mr. R.C. Munch when he left his farm near Rusape where he had lived for many years and I traveled to many countries around the world, always bringing back a few plants.

I had a big upset when I had to move from my farm in 2002 but I brought all my plants with me to a new property near Harare - it took 3 months to relocate them all. With the exception of some big plants, losses were few. I now find living in Zimbabwe to be trying, so have sold my property with the cycads and will be going to live in England, the country of my birth. So ends 48 years with cycads. In Zimbabwe a cycad trust has been formed



Figure 14.—: Ian Turner with an *Encephalartos chimanimaniensis* in his garden near Harare, Zimbabwe

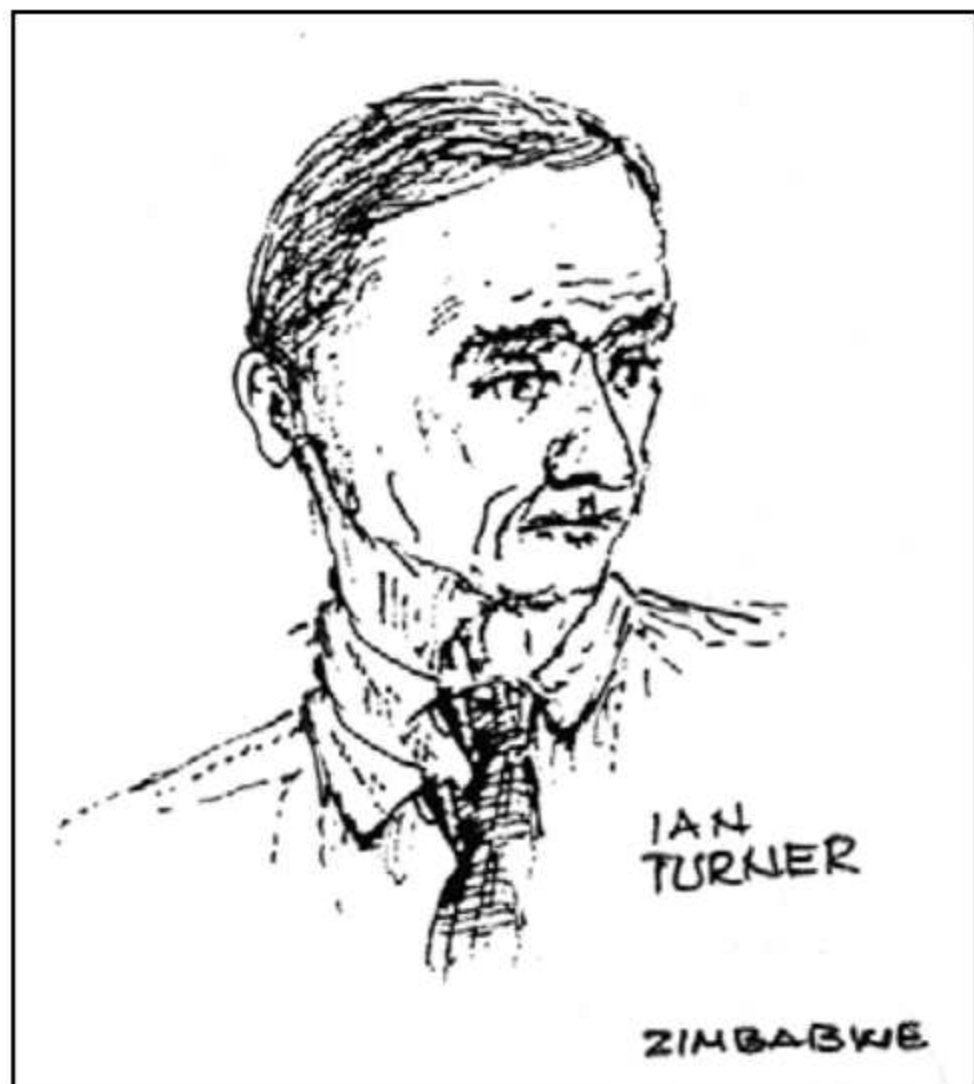


Figure 15.—: Ian Turner as sketched by Dennis Lapham in China in 1996

so I can be happy that my collection will remain intact for years to come.

I had a few memorable occasions on my journeys, such as first discovering in north Mozambique a cycad which was named *Encephalartos turneri* after me, and finding the yellow coned *E. flavistrobilus* in Zambia where no yellow coned cycads had previously been recorded was very exciting. But the best of all was the re-discovery of *Zamia wallisii* in Colombia. It had not been seen since 1895 when Wallis discovered it, so with the help of a friend in Colombia we were the first to see this beautiful *Zamia* for over 100 years.

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Figure 16.—: Ian Turner, tired but happy, demonstrating adult and juvenile leaves of *Ceratozamia morettii* in Mexico, 1999. Photo: Piet Vorster



Figure 17.—: Ian Turner during a field trip in eastern Zimbabwe.

discovery of *Zamia wallisii* in Colombia. It had not been seen since 1895 when Wallis discovered it, so with the help of a friend in Colombia we were the first to see this beautiful *Zamia* for over 100 years.

(97) Nat Grobbelaar

Nat was not available for comment, but we have been able to compose the following:

While Professor of plant physiology at the University of Pretoria, Nat had a particular interest in nitrogen fixing micro organisms which led him to the Cyanobacteria in the coralloid roots of cycads. Then shortly before his retirement his wife Hanneke (now also a member of the Society) gave him a cycad as a birthday present. As they say, the rest is history. Nat began pollinating plants in friends' gardens, and before long he had a nursery going which is extensive and very successful today. He also started collecting cycads seriously for his large and beautiful garden in a frost-free area.

Now retired, Nat is active in the field of cycadology. His extensive nursery keeps him very busy, and in the recent past he was still conducting field research on cycad physiology and behaviour. He will probably most fondly be remembered by posterity for his book, *Cycads, with special reference to the southern African species*, of which there is also an Afrikaans edition

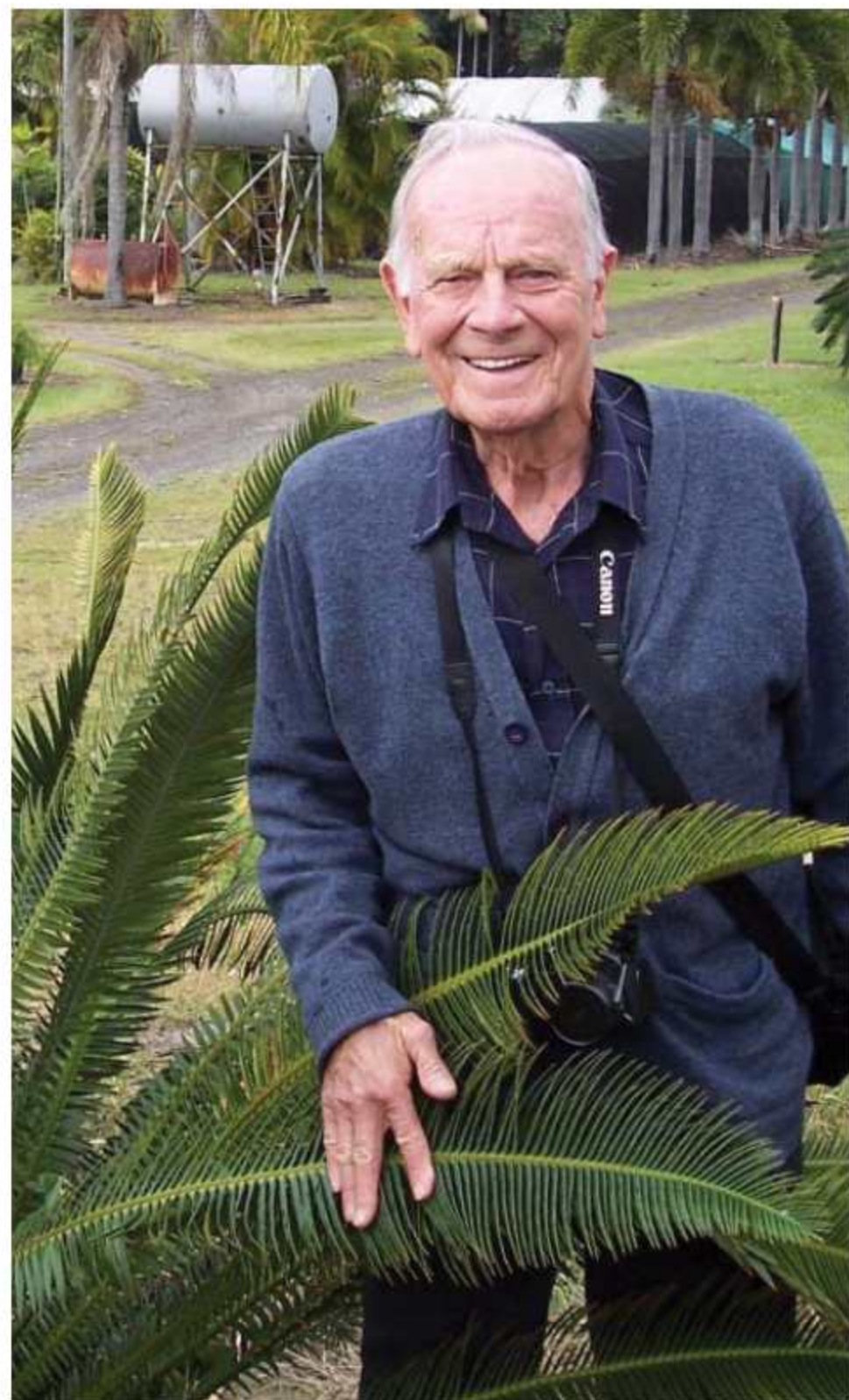


Figure 18.—: Nat Grobbelaar admiring *Dioon merolae* in Stan Walkley's nursery near Brisbane, Australia. Photo: Stan Walkley.

We venture to suggest that one of the highlights of his involvement with cycads was his presidency from 1990 to 1993. He was also involved with the hosting of CYCAD '93 in Pretoria. He undertook several cycad-related journeys, most memorably to Australia (1990) and China (1996) in conjunction with the respected International Conferences on Cycad Biology.



Figure 19.—: Nat Grobbelaar as sketched by Dennis Lapham during the 1996 journey to China.



Figure 20.—: Nat Grobbelaar as sketched by Dennis Lapham during the 1996 journey to China.

ENCEPHALARTOS NO. 100 – A MILESTONE TO CELEBRATE

by Roy Osborne¹ and Ian Bassingthwaite²

One way of judging the success (or notoriety) of something nowadays is to “Google” it and see how many “hits” you score. Earlier this year we did this for “The Cycad Society of South Africa”, and scored a remarkable 11,300 hits. Importantly, the Society’s own website, www.cycad-society.org, was the leader on the list. Considering that in conjunction with the fact that our magazine *ENCEPHALARTOS* has had an unbroken run of 100 issues, the sustained interest of our members and the sound administration by our officer bearers, is unquestionable.

The Society is born

It was the well-known East London palm and cycad enthusiast, Cyril Manthe, who in December, 1983, pro-

duced a “Newsletter for the South African Palm & Cycad Collector”; the first issue being followed by Nos 2 and 3 in 1984. During this period, there was much discussion as to whether there should be a Palm & Cycad Society, or whether there should be two separate such Societies. The latter viewpoint prevailed and invitations to join “The Cycad Society of Southern Africa”, as it was first known, were sent out in 1984. By November of that year, 100 members had joined and the first committee established with Roy Osborne (Chair) assisted by Douglas Goode, David Hardy, Cynthia Giddy, Maans Kemp and Piet Vorster. Interestingly, 15 of the original 100 members have maintained their membership throughout the Society’s existence.

The Society grows

From these simple beginnings, the Society has grown from strength to strength. The Society has evolved a well-servicing Constitution that is continuously re-evaluated and

¹ 119 Calhoun Street, McDowall, 4053 Australia
² 2PO Box 176, Montana Park, 0159 South Africa

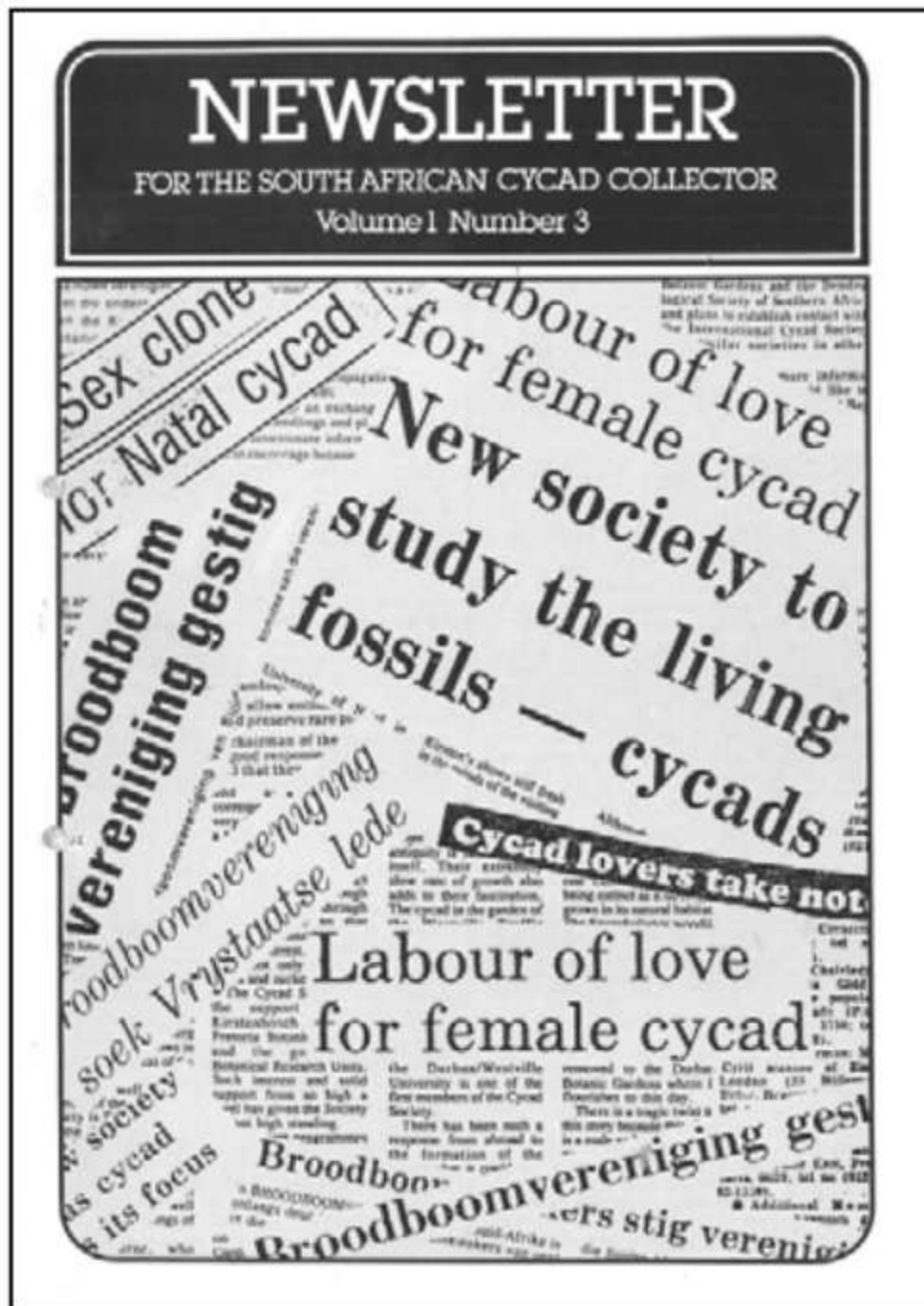


Figure 1.—: Image of the front cover of Vol 1(3) of the November 1984 "Newsletter for the South African Cycad Collector", forerunner to *ENCEPHALARTOS*, showing a montage of newspaper headlines referring to the formation of the (then) Southern African Cycad Society.

improved. A name change from the "Southern Africa" to "South Africa" was approved by members in 1992. Membership has continuously increased with a very healthy current number of 988 as at the time of writing, 80% of whom are local members and 20% of whom are international. Our international membership now includes mainly members from Australia and the USA, but also from Austria, Canada, China, the Czech Republic, Denmark, the Dominican Republic, France, Germany, India, Indonesia, Italy, Japan, Kenya, Namibia, the Netherlands, New Zealand, Spain, Swaziland, the United Kingdom and Zimbabwe.

The membership statistics show a healthy growth from 1984 to 2010, the only "glitch" being a significant falloff in our overseas membership in 2008; this probably attributable to the insidious effects of the global financial crisis at that time.

Month and year	Local members	Overseas members	Total members
March 1985	136	3	139
March 1986	350	25	375
March 1988	500	100	600
March 1990	605	156	761
March 1996	560	235	795
March 1999	597	217	814
March 2002	587	191	778
March 2004	601	251	852
March 2008	802	93	895
March 2010	800	188	988

Interestingly, one can parallel this healthy increase with the dramatic increase in cycad species known during the Society's existence. Most of the new species descriptions have involved members of our Society.

Genus	No. of species 1985	No of species 2010
<i>Bowenia</i>	2	2
<i>Ceratozamia</i>	9	27
<i>Chiqua</i>	0	0
<i>Cycas</i>	15	105
<i>Dioon</i>	10	14
<i>Encephalartos</i>	43	65
<i>Lepidozamia</i>	2	2
<i>Macrozamia</i>	14	41
<i>Microcycas</i>	1	1
<i>Stangeria</i>	1	1
<i>Zamia</i>	33	71
Total	130	329

Persons who have rendered exceptional services to the Society, or who have materially advanced our the knowledge of cycads, have been recognised as honorary life members: these include Isabella Claassen, Nat Grobelaar, Maans Kemp, Knut Norstog, Roy Osborne, Divya D. Pant, Guillaume Theron and Piet Vorster.

Office bearers

Any organisation requires a team of administrators who deal with the matters of constitution, finance, public relations, communications and events. The Society has

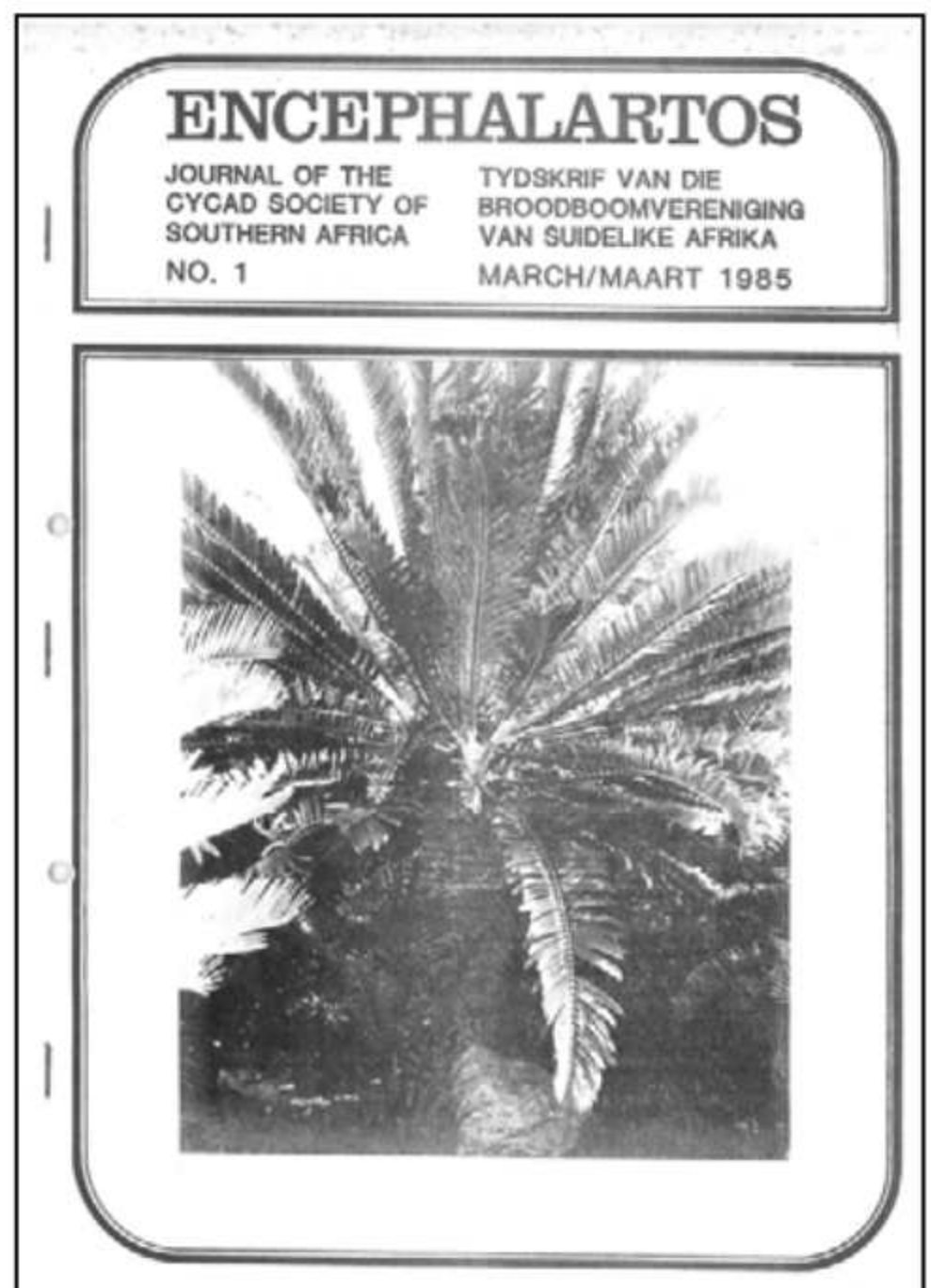


Figure 2.—: Image of the front cover of the very first issue of *ENCEPHALARTOS*, edited and produced by Maans Kemp in March 1985, who also wrote the first Focus on .. article, featuring *Encephalartos longifolius* in that issue.



Figure 3.—: The most prestigious event hosted by our Society was undoubtedly the Third International Conference on Cycad Biology, held in Pretoria in July 1993, and associated with extensive pre- and post-Conference tours for our overseas visitors. This photograph shows organising committee members Roy Osborne (left) and Nat Grobbelaar (right) at the Conference opening ceremony, with Professor Kobus Eloff of the National Botanical Institute and with the Mayor of Pretoria.

been fortunate to have had a core of enthusiasts who have given of their time and talents to keep the Society in good shape. We recognise and thank them for their all-important contributions.

Office-bearers for the Society 1984 – 2010

1984-1985: Roy Osborne (President), Cynthia Giddy, Douglas Goode, David Hardy, Maans Kemp, Piet Vorster.

1986-1987: Roy Osborne (President), Marion Debruyne, Cynthia Giddy, Maans Kemp, Frank Marx, Danie Nel, Piet Vorster.

1988-1989: Roy Osborne (President), John Burchmore, Cynthia Giddy, Maans Kemp, Frank Marx, Danie Nel, Stef Schoeman, Roy Shooter, Pieter Stroebel, Piet Vorster.

1990-1991: Nat Grobbelaar (President), John Burchmore, Harry Gerber, Cynthia Giddy, Neil Munro/Bunny Wentzel, Danie Nel, Stef Schoeman, Roy Shooter, Pieter Stroebel, Ben Visser, Piet Vorster.

1992-1993: Nat Grobbelaar (President), H.C. Barnard, Isabella Claassen, Harry Gerber, Frank Marx, Corrie Meyer, Ollie Minnie, Neil Munro, Kobus Naude, Danie Nel, Koos Ooshuyzen, Roy Shooter, Pieter Stroebel, Ben Visser, Piet Vorster.

1994-1995: Hannes Robbertse (President), Isabella Claassen, Giel Fourie, Frank Marx, Corrie Meyer, Ollie Minnie, Susan Myburg, Danie Nel, Koos Ooshuyzen, Roy Shooter, Piet Vorster.

1996-1997: Hannes Robbertse (President), Isabella Claassen, André de la Rey, Giel Fourie, Hanneke Grobbelaar, André Jordan, Frank Marx, Corrie Meyer, Ollie Minnie, Danie Nel, Piet Vorster.

1998-1999: Frederick de Jager (President), Isabella Claassen, Hanneke Grobbelaar, Corrie Meyer, Ollie Minnie, Danie Nel, Guillaume Theron.

2000-2001: Piet Vorster (President), Isabella Claassen, Gerrie de Haas, Diekie de Klerk, Werner Diedricks, Don Giese, Derik Minnaar, Danie Nel, Guillaume Theron, Leon van Rooy.

2002-2003: Piet Vorster (President), Isabella Claassen, Gerrie de Haas, Diekie de Klerk, Werner Diedricks, Manie Maritz, Derik Minnaar, Danie Nel, Guillaume Theron, Wynand van Eeden, Rudi van Niekerk, Leon van Rooy.

2004-2005: Piet Vorster (President), Charles de Beer, Diekie de Klerk, Xander de Kock, Werner Diedricks, Derik Minnaar, Danie Nel, Diderik Nel, Guillaume Theron, Pieter van der Walt, Wynand van Eeden, Rudi van Niekerk.

2006-2007: Piet Vorster (President), Ian Bassingthwaite, Frikkie Conradie, Charles de Beer, Diekie de Klerk, Xander de Kock, Werner Diedricks, John Evert, Morné Ferreira, Danie Nel, Diderik Nel, Eben Swanepoel, Pieter van der Walt, Wynand van Eeden, Rudi van Niekerk.

2007-2008: Xander de Kock (President), Ian Bassingthwaite, Frikkie Conradie, Mark Crooks, Piet de Bruyn, Diekie de Klerk, Marius Helm, Alicia Krige, Robert Kunitz, Nat Grobbelaar, Danie Nel, Glen Steyn, Eben Swanepoel, Dirk van der Walt, Pieter van der Walt, Wynand van Eeden, Rudi van Niekerk, Jaap Viljoen.

2009-2010: Xander de Kock (President), Ian Bassingthwaite, Piet de Bruyn, Diekie de Klerk, Marius Helm, Alicia Grobler, Robert Kunitz, Danie Nel, Richard Potter, Dirk van der Walt, Pieter van der Walt, Rudi van Niekerk, Jaap Viljoen.

In addition to the above, we recognise the good work done by the Society's overseas representatives: Douglas Atwater, succeeded in 1992 by Willie Tang (USA), Paul Kennedy (Australia) and Keith Boyer (New Zealand).

Our magazine ENCEPHALARTOS

Without a doubt, the most important activity of our Society has been the production of the now 100 issues of our magazine *ENCEPHALARTOS*. The first issue, produced by Editor Maans Kemp in March 1985, was a simple black-and-white production, run off in a photocopy machine in Port Elizabeth. Significantly, the first issue had the popular "Focus on" article, which has continued to be a core part of the magazine and has now dealt with near one-third of the world's cycad species. A valuable service, especially to our members involved with cycad research projects, has been the "New Scientific Reports" section where short summaries are presented of cycad-related material that has been published in scientific journals internationally. Colour was introduced into the magazine; firstly with the front cover being outlined (from issue # 29) and from 1999, with colour throughout (from issue # 58). Our current very professional-looking magazine is the envy of many other plant Societies, both locally and internationally.

A special volume "Cycad Conservation in South Africa – issues, priorities and actions", edited by John Donaldson, was published by the Society in March 1995.

Encephalartos Editors

Issues 1 – 16	Maans Kemp
Issues 17 – 21	Neil Munro/ Bunny Wentzel
Issues 21 – 31	Neil Munro
Issues 32 – 76	Isabella Claassen
Issues 77 – 92	Wynand van Eeden
Issues 93 – 98	Alicia Krige, later Alicia Grobler
Issues 99 – current	Wynand van Eeden

CYCAD 93 – the Conference

The first two Cycad Conferences were those in Nice, France, in 1987, and in Townsville, Australia in 1990. Twelve South Africa delegates attended the Australia meeting and it was these delegates who proposed that the Third International Conference on Cycad Biology would be held in Pretoria, South Africa, over the period 5-9 July 1993. This was a major event for our Society and is regarded by many as the most successful of all the International Meetings held to date. The Proceedings were published by the Society under Piet Vorster's editorship, included 44 scientific papers, and ran to an impressive 449 pages. A full report on the meeting appeared in *Encephalartos* No. 35 of September 1993.

Proceedings of the Third International Conference on Cycad Biology

held in Pretoria, South Africa, 5–9 July 1993

Congress theme: Conservation through cultivation

P. Vorster,
Editor

Hosted by the Cycad Society of South Africa
Held under the auspices of the I.U.C.N.'s Cycad Specialist Group

Published by the Cycad Society of South Africa, Stellenbosch

1995



Figure 4.—: Front cover of the Proceedings of Third International Conference on Cycad Biology, edited by Piet Vorster and published by the Society. This volume included 44 scientific papers, and ran to an impressive 449 pages.

The future?

ENCEPHALARTOS has been an important tool in communications with our members. Many of the subscribers were simply collectors of South African cycads but have now gained a much broader insight into cycad biology and the global spectrum of the order Cycadales. Our magazine has been an important conduit of information for research workers too and we are optimistic that a new generation of cycad researchers will continue some of the work mentioned in our first 100 issues.

We believe also that the Cycad Society of South Africa should offer to host another of the International Conferences on Cycad Biology. Perhaps a bid for a South African CYCAD 2014 or 2017 could be made at the December 2011 meeting in China? There is much to offer, and much to gain, from the interaction with overseas and local cycad experts and enthusiasts.

HEROES OF THE SOCIETY

In the good old days of the *Cold War*, there was a special award for *Heroes of the Soviet Union*. Surely it is not such a bad idea to recognise as Heroes of the Society those members who helped to cement the bonds within our Society?

To implement this, we have to consider the aims of the Society. Shall we search for the member who has the largest number of plants, the biggest plants, the greatest number of species, or the most beautiful plants? To be fair, to accommodate a large number of plants can be problematic unless one has unlimited space. Remember, a mature plant takes up 15 to 40 square meters, not allowing for artistic landscaping or servicing space round the plant. We all would like to have big plants, but gone are the days when we could with impunity dig big plants out of the veld without compromising their survival in nature, and (dare I say it?) without compromising our continuing freedom. The plants grow a good deal faster than initially thought, yet one needs about 1½ lifetimes to grow a 2 meter stem from seed. As for possessing the largest possible number of species, most of us try. Here the eternal problem of space soon rears its abominable head. Apart from that, not all species are a credit to our gardens, in fact, some are outright ugly. Lastly, cycads do differ in their environmental requirements, and we venture to say that it is not possible to grow all species successfully at the same location. An ideal which we can all achieve, is to grow to perfection those plants which we do have. This takes more craftsmanship than one would think, because of the vagaries of climate and the tribulations of heat waves, black frosts, gales, hail, excessive rain, and drought. A few of us are lucky to live in a near perfect climate, but the rest of us battle against severe odds.

All of the above are laudable aims of any cycadophile, whether attainable or not. However, in Society context, none of these would qualify anyone for recognition as a Hero of the Society. To understand this, we should understand what the Society is all about.

The Society exists to bring like-minded spirits together to exchange information and ideas, and ideally plants. This automatically means just that: one does not belong to the Society for what one can get out of the association, but for what one can give in terms of this aim. It is in this context that we have to hunt for Heroes.

In this regard we think immediately of those who serve or served in an administrative capacity. These members, whether serving in national or in branch context, are the backbone of our Society. They give direction to the Society, and spend long and often lonely hours doing the surprisingly taxing administration of the Society. This work is nevertheless rewarding, maybe somewhat less so when we quarrel amongst each other. The most lonely position is that of President or Branch Chairman, where it is often a case of the tallest tree catching the most wind. Arguably the most taxing position is that of Secretary-Treasurer. Without respite he has to cajole us to pay our annual membership fees, keep track of the money, and ensure that we get the best possible benefits from our membership. The officers of the regional branches are the closest to us, and they are the people who organise our get-togethers where we get to know one another, exchange information, and go out to learn about cycads.

Then there is arguably the most important and abused member: the Editor of *ENCEPHALARTOS*. We have always been very fortunate with getting wonderful editors. From the beginning when Maans Kemp edited every issue, probably typed it himself, had it duplicated and stapled together, addressed, and mailed; right to the present where the likes of Isabella Claassen, Wynand van Eeden and Alicia Grobber spoilt us by designing and typesetting every issue, perhaps only the technology changed. The Editor still has to beg and threaten people inside and outside the Society to write contributions, and more often than we think he writes material himself. And heaven helps him if *ENCEPHALARTOS* is more than a few days late (like this issue). At least there is some consolation in that we miss *ENCEPHALARTOS*. Surely at least some of these members deserve to be acknowledged as Heroes of the Society? Unfortunately not. It has always been our policy that one serves the Society without any thought of personal gain, freely giving one's time and energy even when it is long after bedtime.

Who then remains? Perhaps the most important factor binding us together, is *ENCEPHALARTOS*. Without *ENCEPHALARTOS* the Society cannot exist, and *ENCEPHALARTOS* cannot exist without us, the members, keeping it alive with our contributions. Many of us think that we are not bright enough to contribute, but remember that this is a newsletter, not a scientific periodical. Some of the most interesting and valuable contributions over the years have been the letters to the Editor, as can be seen from the index to the first 100 issues. The real Heroes are those who kept the Editor supplied with contributions. It is beyond our scope to assess each and every contribution. Some members contributed no more than five or ten submissions, but each one is a masterpiece which added materially to our knowledge. Instead we assessors have been lazy, and instead investigated who submitted the most contributions over the years. Contributors were judged according to the number of times which their names appear as author or co-author of contributions. Surprisingly each of the top ten contributors also served the Society for many years in administrative capacity. These ten are then here designated as Heroes of the Society:

Roy Osborne. 210 Contributions. Roy is the founding father of our Society. He was a member of the *South African Palm and Cycad Collector*, and in their 2nd Newsletter (page 8, undated but probably June 1984) he advocated the establishment of a dedicated Cycad Society. By rights he is thus the first member of this Society.

He served as first Chairman (later President) from March 1985 to December 1989, and afterwards he represented the Society in the *Cycad Interest Group* of the *International Union for the Conservation of Nature and Natural Resources*. He was present at the first *International Conference on Cycad Biology* in 1987, and attended most of the subsequent conferences. In fact, his leadership and enthusiasm did much to make these conferences successful and sustainable.

Roy has only one passion in life: cycads, in all their aspects. He has inspired a whole generation of enthusiasts to grow these plants and investigate obscure aspects of their lives. This is testified by the wide range of topics about which he wrote for *ENCEPHALARTOS*.

Piet Vorster. 175 Contributions. Piet was also one of the very first members of the *South African Palm and Cycad Collector*, and subsequently the *Cycad Society of South Africa* where he holds membership no. 16. He is the longest serving President, having served as acting President for six months in 1990 and 1991, and as President from 2000 to 2007. Indeed, he served the Society continuously from 1985 to 2007. In real life he is a plant taxonomist, interested in the circumscription of species as a framework on which hangs information. He is a firm believer in the “fun” aspect of Society membership.

Nat Grobbelaar. 166 Contributions. Nat is also a long-time member, holding membership number 97. A plant physiologist before (and indeed also since) his retirement, he is naturally interested in how plants function, and his many enlightening contributions to *ENCEPHALARTOS* reflect this. He was the second President of the Society, from 1990 to 1992. He is a stickler for precise procedure, and upgraded our laid-back constitution on at least two occasions. His understanding of the nature of cycads resulted in the introduction of sometimes novel terminology. Since his retirement he became a very serious cycad collector, and he also has a very successful commercial cycad nursery.

William Tang. 68 Contributions. Willie, resident in Miami in subtropical U.S.A., initially trained as a botanist. As a protégé of Knut Norstog of the *Fairchild Tropical Garden*, he discovered insect pollination in *Zamia integrifolia* in 1987, only the second time that insect pollination had been demonstrated in cycads. In his spare time he continues his research on possible insect pollinators. He has for a very long time been our representative in the U.S.A., handling the membership fees of our American members. He works for the U.S. Department of Agriculture, not as a botanist but as an entomologist, to prevent the introduction of harmful insect pests with agricultural products. As such his contributions on the dreaded *Aulacaspis* scale insect are to be taken very seriously. Willie has travelled widely, and we have become accustomed to his interesting, informative, and thoughtful contributions to *ENCEPHALARTOS*.

Wynand van Eeden. 34 Contributions. While a comparative latecomer to the Society (he is member no. 2471), Wynand embraced his part with gusto. First co-opted to the Council in 2001 with the Portfolio of *Electronic Services*, he created our web page before handing it over to Pieter van der Walt. Subsequently he took over from Isabella Claassen as Editor of *ENCEPHALARTOS*, from 2004 to 2007, and again from the end of 2009 to the present. His vocation as electronic engineer enabled him to transform *ENCEPHALARTOS*, but is an onerous and often thankless task when the publication date approaches and we have failed to send in sufficient contributions. Apart from recruiting material and editing, he continued the example of Isabella Claassen of designing and typesetting the whole issue himself. At about the time when he took over as Editor, Elsa Vorster who for many years handled the addressing, packing, and mailing of *ENCEPHALARTOS* took ill, so that burden was taken up as well by Wynand. He is a firm believer in the fun aspect of the Society, and disregarding his *From the Editor* contributions is at our peril.

Hannes Robbertse. 29 Contributions. Hannes (member no. 1654) was our well-loved President from 1994 to 1995. As lecturer in plant anatomy, he has a wide-ranging interest in many aspects of plants, reflecting the climate in his department at the University of Pretoria which also included Isabella Claassen, Nat Grobbelaar, Guillaume Theron, and Piet Vorster. Apart from a serious interest in cycads, he is also a gifted gardener and landscaper, and it was he and Guillaume Theron who single-handedly translocated the extensive rockery of the Botany Department when the terrain was needed for a parking space.

Danie Nel. 27 Contributions. Danie (member no. 261) is also a long-time member of the Society. In the early days he handled our seed- and pollen bank, during which process he got to know us pretty well. Later (together with Roy Osborne) he started a business called *The Cycad Centre* which supplied all kinds of cycad-related products, and still later he took over Cynthia Giddy's nursery at Umlaas Road which he still runs with his wife Avis, to the benefit of generations of cycadophiles. From the start of the KwaZulu-Natal Regional Branch Danie was involved, and to this day he is their representative on our Council. Indeed, he is the longest serving office bearer, having served continuously from 1986 to the present.

Isabella Claassen. 26 Contributions. Isabella is another product of Pretoria University's Botany Department, where she lectured on cryptogams (fungi, algae, mosses, and ferns). She has a wide interest in plants apart from cryptogams, and long before she had her own free-standing house, she grew plants like stapeliads in trays on her windowsills. When she took over editorship of *ENCEPHALARTOS* she transformed the newsletter, but also set a standard which assured that future editors would have no easy time. Isabella is not a field botanist, but her contributions to *ENCEPHALARTOS* were based on astute observations on her cultivated plants, many of which she grew from seed.

Hanneke Grobbelaar. 25 Contributions. It was Hanneke (member no 1400) who sparked her husband Nat's interest in cycads when she gave him a cycad for his birthday just before his retirement, probably not realising how it would give new direction to her own life. Subsequently she became actively involved with the Transvaal Regional Branch, and her comprehensive and entertaining contributions did much to cement relations between members of not only the Transvaal Regional Branch, but the Society as a whole.

Xander de Kock: 21 (22) Contributions. Xander (member no. 851) is our current President, having the onerous task of steering the Society over turbulent waters in a time of restrictive legislation, eradication of species in nature, and commercial interests. He is particularly serious about conservation, and works closely with Limpopo province's conservation people. This took him to remote places where few of us will ever see, but also to heart-rendering scenes. All these are reflected in his contributions to *ENCEPHALARTOS*.

These ten are closely followed by Derik Minnaar and the late Cynthia Giddy with 21 contributions each.

NEW MEMBERS

The Society welcomes the following new members who joined during April and May, 2010. They are reminded to make contact with the Chair persons of their respective regions to ensure that their contact details are on record for regional news and details of meetings/ excursions which may be arranged locally.

3706	M	HORN, Mev R S	MIDDELBURG, 1050
3707	G	KRUGER, Mnr P C	NORTHCLIFFE, 2195
3708	G	MILLS, Mr W C	GEZINA, 0031
3709	W	PHARO, Mr A	NEWLANDS, 7700
3710	G	HAACKE, Dr K	RYNFIELD, 1514
3711	N	VAN HEERDEN, Mnr A H	RUSTENBURG, 0300
3712	K	HUTT, Mr W R	MANORS, 3610
3713	G	KUHN, Mnr A P	LYNNWOOD, 0081
3714	G	KUHN, Mr R C	LYNNWOOD, 0081
3715	K	PUTZ, Mr C	HILLCREST, 3650
3716	G	ROOS, Mr V	SUNNINGHILL, 2157
3717	G	VAN ZYL, Mnr W J	PRETORIA NOORD, 0182
3718	K	COETZEE, Mr P	LINK HILLS, 3652
3719	K	HERMON, Mr R B	ASHWOOD, 3605
3720	G	MACHEKE, Mr A	SOUTHGATE, 2082
3721	K	Mc GENNIS, Mr C	LINK HILLS, 3652
3722	G	MOOLMAN, Dr G M	MAGALIESKRUIN, 0150
3723	G	MÜLLER, Mev E & Mnr P	SINOVILLE, 0129
3724	G	NEL, Mnr R	HATFIELD, 0083
3725	K	NEVILLE, Mr R	CAMPERDOWN, 3720
3726	K	PETERSEN, Mr Anthony	KLOOF, 3640
3727	K	PETERSEN, Mr Arn	CATO RIDGE, 3680
3728	K	PETERSEN, Mr Luca	LINK HILLS, 3652
3729	K	STEVENS, Mr F R	CATO RIDGE, 3680
3730	K	VAN WINKEL, Mr M	CATO RIDGE, 3680
3731	K	WRIGHT, Mr W L	CATO RIDGE, 3680

DRAFT CONSTITUTION 2009/2010 – FOR COMMENTS BY CSSA MEMBERS

Included in this issue you will find a separate booklet containing the new proposed constitution. If you have any comments, please send them to Dr Xander de Kock at xanvet@netactive.co.za. This should happen no later than the 14 of September.

KONSEPGRONDWET 2009/2010 – VIR KOMMENTAAR DEUR CSSA-LEDE

Ingesluit in hierdie uitgawe sal u die nuwe voorgestelde grondwet kry. Indien u enige kommentaar het moet u dit asseblief stuur aan Dr. Xander de Kock by xanvet@netactive.co.za. Enige kommentaar moet voor 14 September gestuur word.

THE CYCADS OF THE KABOUGA AREA OF THE ADDO NATIONAL PARK

(Kirkwood District)

A visit by the Eastern Cape Branch of The Cycad Society of South Africa – Marius Helm

The members of the Eastern Cape Branch of the Cycad Society of South Africa visited the Kabouga area and mountains north-west of Kirkwood, part of the greater Addo National Park. We were escorted by Nollie Bosman from The Addo National Park.

Our journey started at the Darlington Dam following the Bedrogberg / Addo Elephant Eco Trail to Kirkwood, we were lucky enough to see some of the white rhino that was recently introduced to this area.

As our track slowly started up the mountains we started to see some plants of *Encephalartos lehmanii* growing on the mountainside. This area is below the mist

belt and the plants grow in fairly harsh conditions. The soil seems to be well drained and made up of various sedimentary materials. We noticed that some of these *E. lehmanii* plants were badly damaged by porcupines and as you can see in some of the photos in some areas, fair sized trunks were lost due to this. The porcupine damage was however fairly limited, and could be seen as part of the normal cycle of life.

We also noticed that a fair number of plants were attacked by a weevil and in some areas complete clumps were affected. The plants may look fine on the outside but will be rotten inside. It would seem as if these plants are less resistant to the weevil attack during times of seri-

ous drought. We would like to think that these weevils are always present, but flourish in these times of serious drought. We could see no new seedlings around any of the *E. lehmannii* plants. The only visible way of regeneration seems to be through the production of suckers.

As we moved further up the mountain and into the mist belt we started to encounter the giants of the mountain, *Encephalartos longifolius*. These plants are not found below the mist belt, however, we have encountered some *E. lehmannii* plants above the mist belt growing amongst *E. longifolius*. We did not see any intermediate plants where the habitat overlaps.

Encephalartos longifolius specimens were spectacular with some real monsters among them. We could not see any serious signs of weevil attack on *E. longifolius*. There were good signs of seedlings, and we counted up to 30 to 40 seedlings under some female plants. The plants started to cone and a fair number of female cones were visible. We did however encounter some plants that were dead due to an unknown reason. The leaves seem to turn brown from the tips and eventually abscise from the stem, the stems are rotten as well, note that we did see some weevils in these rotten plants, but they do not seem to be the main cause of the problem. Most of the affected plants were on top of the mountain and on the southern slopes thereof.



Figure 1.—: *Encephalartos lehmannii*: Plants in habitat. Photo by M Helm.



Figure 2.—: *Encephalartos lehmannii*: Plants in habitat. Photo by M Helm.



Figure 3.—: *Encephalartos lehmannii*: Plants in habitat. Photo by M Helm.



Figure 6.—: *Encephalartos lehmannii*: Porcupine damage. Photo by M Helm.



Figure 4.—: *Encephalartos lehmannii*: Plants in habitat. Photo by M Helm.



Figure 7.—: *Encephalartos lehmannii*: Porcupine damage. Photo by M Helm.



Figure 5.—: *Encephalartos lehmannii*: Plants in habitat. Photo by M Helm.



Figure 8.—: *Encephalartos lehmannii*: Porcupine damage. Photo by M Helm.



Figure 9.—: *Encephalartos lehmannii*: Weevil and larvae found on plants. Photo by M Helm.



Figure 10.—: *Encephalartos lehmannii*: Weevils found on plants. Photo by M Helm.



Figure 13.—: *Encephalartos lehmannii*: Damaged trunk. Photo by M Helm.



Figure 11.—: *Encephalartos lehmannii*: Larvae found on plants. Photo by M Helm.



Figure 14.—: *Encephalartos longifolius*: Kabouga habitat showing mist line. Photo by M Helm.



Figure 12.—: *Encephalartos lehmannii*: Larvae found on damaged trunk. Photo by M Helm.



Figure 15.—: *Encephalartos longifolius*: Kabouga habitat. Photo by M Helm.



Figure 16.—: *Encephalartos longifolius*: Kabouga habitat with *E. lehmannii*. Photo by M Helm.



Figure 17.—: *Encephalartos longifolius*: Kabouga habitat. Photo by M Helm.



Figure 18.—: *Encephalartos longifolius*: Kabouga habitat. Photo by M Helm.



Figure 19.—: *Encephalartos longifolius*: Kabouga habitat. Photo by M Helm.



Figure 22.—: *Encephalartos longifolius* and *E. lehmannii*, growing together. Photo by M Helm.



Figure 20.—: *Encephalartos longifolius*: Kabouga habitat - Darlington Dam. Photo by Q Olivier.



Figure 23.—: *Encephalartos longifolius*: Plants in habitat. Photo by M Helm.



Figure 21.—: *Encephalartos longifolius* and *E. lehmannii*, growing together. Photo by M Helm.



Figure 24.—: *Encephalartos longifolius*: Plants in habitat. Photo by M Helm.



Figure 25.— *Encephalartos longifolius*: Plants in habitat. Photo by M Helm.



Figure 26.— *Encephalartos longifolius*: Detail of leafbases of plant in Figure 25. Photo by M Helm.



Figure 28.— *Encephalartos longifolius*: Seedlings in habitat. Photo by M Helm.



Figure 27.— *Encephalartos longifolius*: Plants coning in habitat. Photo by M Helm.



Figure 29.— *Encephalartos longifolius*: Seedlings in habitat. Photo by Q Olivier.



Figure 30.—: *Encephalartos longifolius*: Damage on leaves due to disease in habitat. Photo by M Helm.



Figure 31.—: *Encephalartos lehmannii*: Plants in habitat. Photo by Q Olivier.



Figure 33.—: *Encephalartos longifolius*: Queenie Olivier providing scale to what can only be described as a majestic plant in a beautiful habitat. Photo by PJJ van der Merwe.



Figure 32.—: *Encephalartos lehmannii*: Abraham Marais and Johann van der Merwe admiring plants. Photo by Q Olivier.



Figure 34.—: Serious equipment is required to access the habitat. Photo by M Helm.

UITSTAPPIE NA SUID-KAAP, GEORGE EN GOURITZRIVIER: 21 TOT 23 MEI 2010. / EXCURSION TO THE SOUTHERN CAPE: GEORGE AND GOURITZ RIVER: 21 TO 22 MAY, 2010.

Op Vrydag 21 Mei 2010 het ons, ons motors gepak en vertrek na Johan Kotze se plaas, Verresig, so 8Km uit Gouritzrivier. Dit sal vir die naweek ons "basis" wees vanwaar ons Dr Norman Reinach te George en Prof Frederick de Jager te Gouritzrivier se spogtuine oor die volgende twee dae sou besoek. Die eerste lede het so vanaf 16h00 daar aangekom. Johan se luukse vakansiehuis op die plaas het 'n pragtige uitsig oor die see.

Vrydagaand was spanbou aand. Vuurmaakhout was volop en 'n groot vuur is gou in die binnebraai aan die gang gekry. Daar is gesels, vleis gebraai en weer gesels. Laat die aand het moeë lede so een vir een kamers se kan toe verdwyn. Die rit vanaf Kaapstad na Gouritzrivier is meer as 400Km en die volgende oggend moes almal teen 07h00 weer op wees.

Saterdag oggend 08h00 was ons op pad na Dr Norman Reinach op George. Hy het twee tuine wat ons wou besigtig, een by sy praktyk en een by sy woning. Dr Norman het ons ingewag en baie vriendelik verwelkom. Vir die volgende meer as drie ure het hy ons deur sy twee tuine geneem en baie inligting oor sy plante met ons gedeel. Op Figuur 1 is hy aan die woord en luister die lede aandagtig wat hy vertel.

Dr Reinach is ook 'n geregistreerde kweker. Hy bestuur so ver moontlik al sy vroulike keëls. Hy het sy broeikas vir ons gewys en verduidelik hoe hy te werk gaan. Tydens ons besoek het hy gesê dat elf van sy *E. latifrons* sade reeds begin uitloop het. Op Figuur 2 kan 'n deel van sy

On Friday, 21 May, we packed our cars and left for Johan Kotze's farm named "Verregesig" about 8 km's from Gouritz River. The location would serve as our base for the weekend from where we would visit gardens of Dr Norman Reinach in George and Prof Frederick de Jager, also at Gouritz River, over the following two days. The first members started arriving at approximately 16h00 at John's luxury holiday home on the farm, with its beautiful views over the sea.

Friday evening was spent team building. Firewood was in abundance and a large fire was soon burning in the enclosed "braai". There was good interaction amongst the guests, who all chipped it and assisted with the barbecue, whereafter the tired travellers disappeared to their rooms for a well earned rest. The trip from Cape Town to the destination is more than 400 kms and every one had to be ready by 07h00 the following morning.

By Saturday morning at 08h00 we were on our way to Dr Norman in George. He has two gardens, one at his practise and the other one at his home, which we intended visiting. After a warm welcome, the Doc spent more than three hours showing us through his gardens. Figure 1 shows him explaining a point of interest to the attentive group.

Dr Reinach is a registered grower and endeavours to pollinate all the female cones. He showed us his incubator and explained how it works. Figure 2 shows a portion of the nursery located at his practise. He also has a



Figuur 1.—: Foto Nr 1: Dr Norman Reinach (heel regs) aan die woord.



Figuur 2.—: 'n Deel van Dr Reinach se kwekery by sy praktyk.



Figuur 4.—: Teetyd.



Figuur 3.—: Groot skade. Een van Dr Reinach se volwasse plante wat gevrek het.



Figuur 5.—: Agter heel links is die *E. woodii* waarvan twee suiers verwyder moet word.

kwekery by sy praktyk gesien word. By sy woning was ook baie saailinge. Dr Reinach het in totaal meer as twee duisend vyf honderd saailinge beskikbaar. As gevolg van sy baie druk program, verkoop hy tans nie enkele saailinge nie. Indien enigiemand daarin belangstel om al die saailinge as een besending aan te koop, is u welkom om Dr Reinach te kontak en met hom te onderhandel.

As dit my plant was het ek myself sekerlik dood gehuil. Op Figuur 3 kan een van die plante gesien word wat om een of ander onverklaarbare rede besluit het om nie meer verder te groei nie. Hoe baie van ons broodboomliedhebbers het nie ook al hierdie ervaring en teleurstelling beleef nie?

So tussen al die plant besigtiging deur, was daar ook tyd vir 'n lekker koppie tee en koffie met heerlike verversings, voorgesit deur mev Reinach. Op Figuur 4 geniet 'n deel van die lede hul tee, koffie en verversings terwyl die res nog iewers in die tuin rond kyk.

En so het 'n heerlike dag op George saam met Dr Reinach tot 'n einde gekom. Dit was tyd om terug te ry Gouritsrivier toe waar daar eers op die dorp rugby gekyk is voordat ons spanbou daarna by Johan se vakansiehuis op die plaas hervat is. Gelukkig het die Blou Bulle en die Stormers daardie Saterdag hul wedstryde gewen.

Sondag oggend was almal vroeg uit die vere. Ontbyt moes gemaak word, die vakansiehuis moes skoon gemaak word en om 09h30 moes ons reeds by Prof De Jager se plek wees. Dit was ook Johan se verjaarsdag. Skrywer het hom bederf deur vir hom 'n ontbyt voor te berei en almal het hom geluk gewens met sy verjaarsdag.

nursery at his home and there are approximately 2 500 seedlings of various ages. As a result of pressure of work, he does not sell seedlings separately, however, if any one wishes to purchase his entire stock, they are welcome to contact Dr Norman.

If that was my plant, I would most certainly have shed a number of tears. Figure 3 shows one of his cycads which, for reasons unknown, decided to stop growing. How many of us have not experienced this disappointment as well?

Between the viewing of the plants we also found the time to tea, coffee and lovely eats kindly provided by Mrs Reinach. Figure 4 shows a portion of the group enjoying the refreshments, while others were still admiring the garden.

And so ended an enjoyable day in George and it was time to return to our base at Gouritz River, firstly stopping off in the town to watch the two international rugby games played in South Africa that week end. Fortunately both home teams, the Bulls and the Stormers, won their respective games.

There was no lie-in on Sunday morning. Breakfast had to be made, the house had to be cleaned and we had to be at Prof De Jager's place by 09h30. The day was also Johan's birthday, so yours truly spoiled him by preparing him a breakfast.

Prof De Jager's cycads are on a farm some distance from Gouritz River and we were astounded by the quality



Figuur 6.—: Vyf pragtige keels aan 'n gesonde plant.

Prof De Jager se plante is op 'n plaas 'n entjie buite Gouritzrivier. Hy het ons ook ingewag en baie vriendelik verwelkom. Ons was verstom om sulke mooi gesonde en so 'n groot verskeidenheid van plante te sien. Toe ons daar aankom was Adolf Stols en 'n vriend reeds besig om 'n *E. woodii* plant voor te berei vir die verwydering van twee suiers. Op Figuur 5 kan die *E. woodii* plant links agter gesien word. Prof De Jager (met die pienk hemp) is besig om van die plant af weg te loop. Een lid het skertsend opgemerk "hy wil nie sien hoe hulle sy plant opvoetter nie."

Enkele van die verskeidenheid van plante is hierdie pragtige gesonde plant met vyf keëls soos gesien kan word op Figuur 6. Dit het almal se oog gevang. Die *E. humilis* op Figuur 7 was ewe eens baie treffend. Die *E. hirsutus* op Figuur 8 was uitsonderlik mooi en gesond. Mens mag nie begeer nie, maar wie van ons sal nie ook graag so 'n pragtige *E. hirsutus* in ons tuin wou hê nie? Dit was baie opvallend hoe weelderig en gesond Prof De Jager se plante hier op Gouritzrivier groei.



Figuur 8.—: 'n Pragtige voorbeeld van *E. hirsutus*.



Figuur 7.—: *E. humilis*.

and diversity of plants seen. Upon our arrival, we noticed that Adolf Stols and an assistant were preparing an *E woodii* for the removal of two suckers. On Figure 5 the *E woodii* can be seen towards the left and Prof De Jager in the pink shirt, walking away from the plant which is about to undergo "surgery".

Amongst the plants is this healthy plant with its five cones, as seen in Figure 6. The *E. humilis* in Figure 7 is just as striking. The *E. hirsutus* in Figure 8 was exceptionally attractive and healthy. It is wrong for a person to covet, but who of us would not like to have such a beautiful specimen in our gardens? It was quite astounding to note how profuse the cycads were growing at Gouritz.

It is estimated that there are less than seventy *E. latifrons* plants left in the wild. But here at Gouritz we saw two rows of the species, Figure 9, with at least 15 plants



Figuur 9.—: Twee rye *E. Latifrons* plante, vyftien in 'n ry!!!



Figuur 10.—: 'n Deel van Prof De Jager se kwekery.

Daar word deur sommiges beweer dat daar vandag minder as sewentig *E. latifrons* plante in die natuur oor is. En hier op Gouritzrivier, twee rye *E. latifrons* plante, Figuur 9, van ten minste vyftien plante per ry!!! Elders in die tuin was ook vyf groter *E. latifrons* plante. Ander skaars plante het ook langs die *E. latifrons* in twee-twee rye van ± 15 plante per ry gegroei. Dalk praat ek uit my beurt, maar ek wil myself verstout om te sê dat *E. latifrons* vandag glad nie meer so skaars is soos voorgegee word nie. Hierdie is ook vir my 'n duidelike bewys, en ek twyfel nie een oomblik daarvoor nie, dat die bewaring van ons skaars plante daarin lê en bevorder word, deur kweekers wat hierdie plante kweek en aan ander versamelaars beskikbaar stel.

Prof De Jager is ook 'n geregistreerde kweker. Op Figuur 10 kan 'n deel van Prof De Jager se kwekery gesien word. Na afloop van die besoek, kon lede saailinge koop. Al Prof De Jager se saailinge was die dag op "special". Skrywer is baie trots op sy *E. caffer* wat hy teen 'n baie billike prys aangeskaf het.

Graag wil ons hiermee ook baie dankie sê aan Dr Norman Reinach en Prof Frederik de Jager dat hulle bereidwilling was om ons as groep te ontvang. Baie dankie dat julle jul tuine vir ons oopgestel het en jul kennis en ervaringe oor plante met ons gedeel het. Baie dankie vir jul vriendelikheid. Ek kan die versekering gee dat elke lid die uitstappie na die Suid-Kasap terdee geniet het en dit vir baie lank nog sal onthou.

Aan ons Wes-Kaap sekretaris, Johan Kotze, wat die hele uitstappie gereël het en sy vakansiehuis tot ons beskikking gestel het, wil ek ook baie dankie sê. Vir elke lid wat die uitstappie meegemaak het, dankie vir jul teenwoordigheid.

Vir die ander Wes-Kaap lede wat wees omstandighede nie kon saamgaan nie, julle het baie gemis. Ek wil graag almal wat hierdie artikel lees, ook lede van ander streke, aanmoedig om by jul Tak se aktiviteite betrokke te raak. Ons hele naweek wil ek opsom deur te sê, dit was leersaam en lekker verby.

Artikel en foto's:
Frikkie Conradie

per row! Elsewhere in the garden, there were five larger *E. latifrons* to be seen. Elsewhere other rare species were also to be seen. After what has been seen, I am just wondering if *E. latifrons* is in fact as rare as made out to be. This is also clear evidence that the conservation of our rare plants lies with our growers who make these plants available to other collectors.

Prof De Jager is also a registered grower. Figure 10 indicates a portion of his nursery. After our visit, we were given an opportunity to purchase seedlings, which were all on "special" and the writer is very proud of his *E. caffer* which was acquired at a very reasonable price.

We would like to express our sincere thanks to both Dr Reinach and Prof De Jager for hosting the group and for sharing their knowledge and experience with us. I can assure you that each member of the group enjoyed the excursion to the Southern Cape and will remember it for a long time to come.

Thank you also to the Secretary of the Western Cape Region, Johan Kotze, who arranged the outing, and who made his holiday home available to the group, as well as to all the members who accompanied us, thank you too for your presence.

To all the other members of the Western Cape Region who were unable to attend, I am sure that you realise that you missed a wonderful time. In closing, I would like all who read this article, as well as those from other Regions, to get involved in your Branch's activities. In a nut shell, I think the weekend was informative and most enjoyable.

(Contact details of Chairpersons of regions appear on the inside front cover of this journal and members are encouraged to approach with them with the view to having their addresses/ phone numbers added to the Region's lists. [Secretary]).

Article and photos:
Frikkie Conradie

CERATOZAMIA MEXICANA BRONGN.

¹Roy Osborne & ²Andrew P. Vovides

Introduction

In our Focus on ... series, we have so far dealt with only two species of *Ceratozamia*: *C. norstogii* (Encephalartos No. 90, June 2007) and *C. euryphyllidia* (Encephalartos No. 96, April 2009). In this issue we provide details of *C. mexicana*, the first ceratozamia to be described, and hence the type for the genus, as named by the French botanist Adolphe-Théodore Brongniart in 1846. Our investigation suggests that it may be necessary to review the question: "What is *Ceratozamia mexicana*?"

Brongniart's description was based on cultivated plant material at the Paris Botanical Garden, which we believe was originally collected in the early 1840s by Belgian botanical explorer Auguste Ghiesbrecht from one of several possible plant populations in Veracruz. Brongniart derived the genus name from *κερας* (Greek = horn), referring to the characteristic pair of hornlike structures on each sporophyll facet, and *Zamia*, the most closely related genus.

A note about the holotype for *Ceratozamia mexicana*

The herbarium voucher by Ghiesbrecht, prepared from a cultivated plant in Paris and referred to as *Brongniart s.n.*, and filed at the Museum of Natural History in Paris, is prescribed as the holotype for both the genus *Ceratozamia* and the species *C. mexicana* (Stevenson & Sabato 1986). However, this specimen appears to differ in its leaf dimensions from many cycads identified as *C. mexicana* that we have seen in habitat, in nursery production, and in public and private botanic gardens internationally. Dimensions aside, when the illustration by Brongniart (1846) is examined, the lanceolate leaflet shape is consistent with the holotype, although there are populations of *C. mexicana* with linear-lanceolate leaflets. Recent anatomical work by Sergio Avendaño (2009 doctoral thesis), and work in progress by Vovides, is also helping to clarify the taxonomy of *Ceratozamia*. Much work still needs to be done to resolve discrepancies within this variable genus.

At present, 27 species of *Ceratozamia* are recognized. Of these, 24 are wholly Mexican endemics and two have range extensions to the south (*C. matudae* into Guatemala, and a *C. robusta*-like taxon into Belize and Guatemala) (Osborne et al. in preparation). The only species wholly external to Mexico is *C. hondurensis* from northern Honduras, while the most recently described species of the genus is *C. santillanii* from Chiapas, a taxon with affinities to *C. zoquorum*, published by Miguel Angel Pérez-Farrera and his colleagues (2009).



Figure 1.— Approximate distribution of *Ceratozamia mexicana* in Veracruz. There may be a range extension into the adjacent part of Puebla. Map: Andrew Vovides.

As with many of the 19th Century cycad species descriptions, the concept of *Ceratozamia mexicana* has not been stable. In various publications, F.A.W. Miquel (1847a, 1848) referred to *Ceratozamia brevifrons*, *C. intermedia* and *C. longifolia*. Because these descriptions were made on sterile and often juvenile material, Thiselton-Dyer (1884) recognized that distinguishing between them was "an all but hopeless task", and therefore included *C. latifolia*, *C. robusta* and *C. mexicana* all as subspecies of the latter. Schuster (1932) confused matters by placing all ceratozamias, other than *C. kuesteriana*, under the umbrella of *C. mexicana*.

In the Flora of Veracruz, Vovides et al. (1983) followed the Thiselton-Dyer subspecies classification. However, varietal rankings have since been phased out throughout the Cycadales and recent species descriptions have greatly clarified the taxonomy.

Distribution, habitat and ecology

Populations of *Ceratozamia mexicana* grow on steep hillsides or canyon walls in cloud forest (*bosque mesófilo de montaña*) or pine/oak forest (*bosque de pino y encino*) in northeastern Veracruz, with possible range extensions into Puebla. The best known (but not the only) populations comprise two groups. Firstly, there are those at Esquilon and Coacoatzintla, near the town of Naolinco, respectively about 10 km and 12 km northeast of Xalapa, Veracruz (and visited by Charles Chamberlain over 100 years ago). Secondly, there is a southern population near El Mirador, about 21 km south of the nearby town of Huatusco on the road to Conejos. We will refer to these particular populations as the "Naolinco" and "El Mirador" cycads respectively. The plants are found at altitudes of 900–1500 meters and are usually rooted in organic litter of the forest understorey. The climate ranges from temperate to warm-temperate humid. Annual precipitation 1435–1862 mm, falling mainly during the summer

¹19 Calhoun Street, Macdowall, Queensland 4053, Australia
²Instituto de Ecología, A.C., Apdo Postal 63, Xalapa, Veracruz, 91000 Mexico

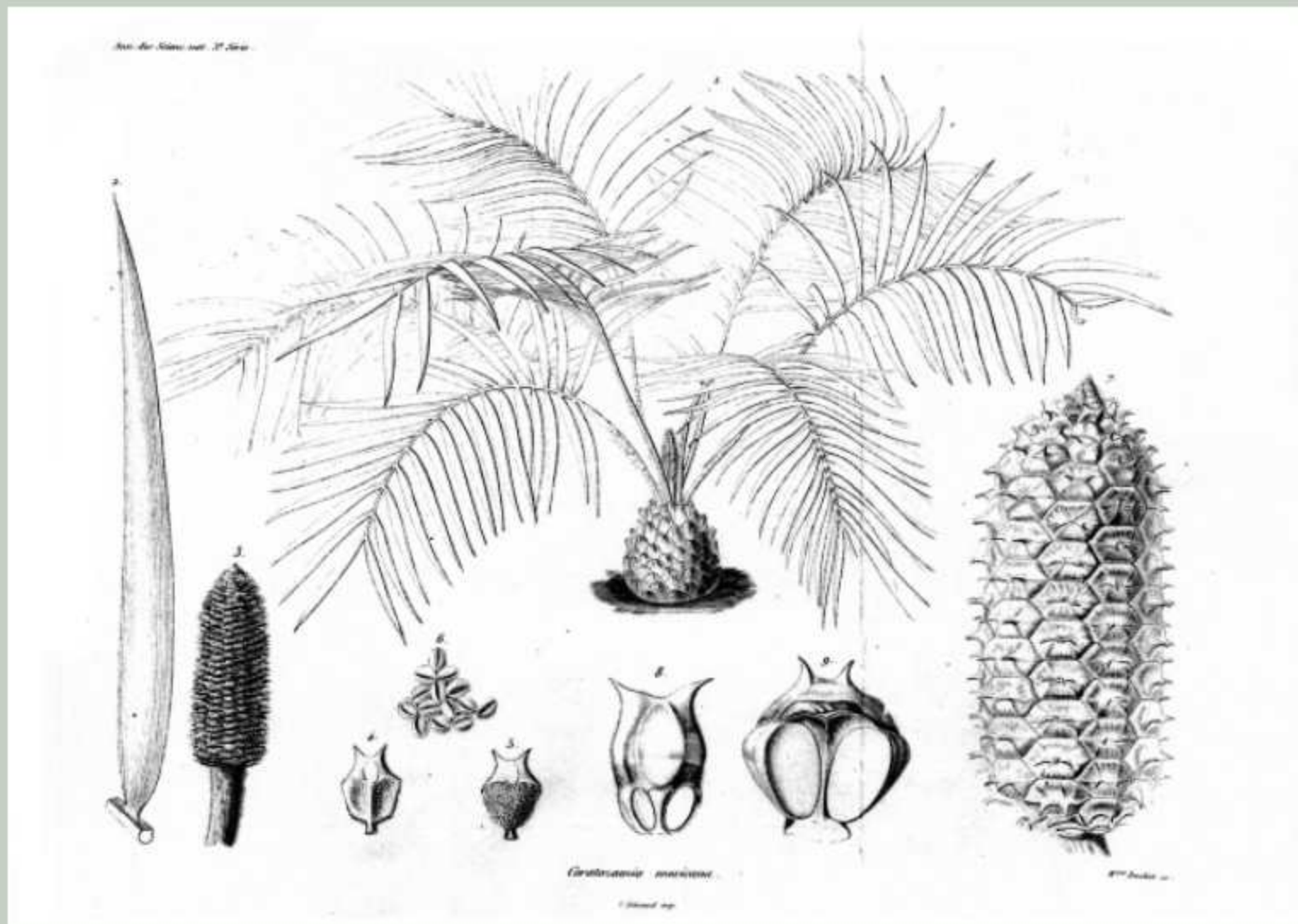


Figure 2.—: The line drawing that Adolphe Brongniart used in his description of *Ceratozamia mexicana*.

months. Average temperatures range from 14 to 30°C in summer, and below 10°C in winter, depending on locality and altitude (García 2004).

Dominant vegetation includes the trees *Quercus* spp., *Liquidambar macrophylla*, *Pinus* spp., *Podocarpus guatemalensis*, *Carpinus caroliniana*, *Ostrya* spp. and various *Chamaedorea* palms.

Pharaxonotha sp. beetles have been reported from both the male and female cones of *C. mexicana* and are therefore regarded as the putative pollinators for this species (Vovides 1991). The Great Curassow (*Crax rubra*) and other frugivorous birds may be seed dispersal agents, together with mice, opossums, peccaries, raccoons, rats and squirrels and fruit-eating bats. Since most plants occur on sloping terrain, gravity will also aid in seed dispersal, particularly when flash floods occur.

Larvae of the lycaenid butterfly *Eumaeus childrenae* (= *E. debora*) feed on the foliage of *C. mexicana* and may sequester cycad toxins from their host plants as an anti-predator tool. Abnormal herbivory levels may affect population dynamics (Contreras-Medina et al. 2003).

Description, vegetative structures

Stems of *Ceratozamia mexicana* are usually solitary but sometimes branched at the base to give a clumped appearance, globose to cylindrical, dark brown, up to 100 cm long by 20 cm in diameter. The 10–20 **leaves** are 150–200 cm long, about 75 cm wide, sometimes slightly tomentose, green emergent in the populations near Esquilon and Coacoatzitla but variously green or brown-emergent for the plants at El Mirador population, becoming a glossy mid- to dark green above and paler green below, flat or slightly keeled in cross-section (pinna-to-pinna angle 160–180°, and gracefully arching in profile. The **petiole** is 30–50 cm long, about 15 mm in diameter, stipulate, swollen and woolly at the base, and moderately



Figure 3.—: The herbarium voucher which is the holotype for both the genus *Ceratozamia* Brongn. and the species *C. mexicana*. This was prepared by Brongniart from plant material collected in Mexico by the Belgian botanical explorer Auguste Ghiesbrecht, supposedly near Xalapa, Veracruz, in the early 1840s, and cultivated at the Botanical Garden of the Museum of Natural History Museum in Paris. Image kindly supplied by Dennis Stevenson.



Figure 4.—: The forested hill on the road to Naolinco, about 10 km NE of Xalapa, Veracruz, where Charles Chamberlain saw *Ceratozamia mexicana* in the wild over 100 years ago. The area is a now mostly deforested, with houses and restaurants along the roadside. This photo was taken by William Tang in 1987.

to heavily armed with numerous prickles 3–4 mm long. The **rachis** is straight, lightly armed with prickles, and bears 40–60 pairs of leaflets in a more or less opposite arrangement. **Leaflets** are lanceolate to linear-lanceolate, straight to falcate, flat to somewhat channelled in cross section, crowded, thick, coriaceous and brittle, gradually acuminate toward a pungent apex, forward projecting toward the leaf apex, with margins entire and moderately revolute. **Median leaflets** are 15–40 cm long by 10–20 mm wide, the populations near Esquilon and Coacoatzintla having generally narrower linear-lanceolate leaflets and the plants near El Mirador being more robust and having generally wider lanceolate leaflets. **Cataphylls** are stipulate, triangular, acuminate, 7–8 cm long by about 6 cm wide at the base. **Eophylls** have 2 leaflets.

Description, reproductive structures

Pollen cones of *Ceratozamia mexicana* are solitary per stem, elongate conical, erect at first and bending slightly at pollen dehiscence, 38–43 cm long excluding the peduncle, 7–8 cm in diameter, medium green, blunt apically, with a densely pale brown tomentose peduncle 7–10 cm long and about 25 mm in diameter. **Microsporophylls** are cuneiform, with face 15–17 mm wide and about 6 mm high, the two horns about 3 mm long, and with the fertile portion covering about two-thirds of the abaxial surface.

Ovulate cones of *Ceratozamia mexicana* are solitary per stem, cylindrical, apically mucronate, erect at first but becoming pendent as the cone matures, greenish brown, 26–35 cm long excluding the peduncle, 9–12 cm in di-

ameter, with a peduncle 6–10 cm long by about 20 mm in diameter. **Megasporophylls** have a distal lobe 27–35 mm wide by 18–25 mm high, the central portion with blackish scales and bearing two stout horns 1–2 mm long, the peripheral areas with a grayish white tomentum. **Seeds** have a sarcotesta initially white, becoming brown and soft at maturity, the sclerotesta ovoid, somewhat three-sided, pale brown, 23–30 mm long by 15–18 mm in diameter, and smooth except for a few shallow longitudinal grooves.

The chromosome number for *C. mexicana* is $2n = 16$.



Figure 5.—: *Ceratozamia mexicana* specimens perched somewhat vulnerably above a limestone quarry at Tlalchinola, 11 km N of Xalapa, Veracruz. Quarrying operations have since been halted in response to protests from cycad conservationists. Photographed by Craig Nazor in 2005, during the Seventh International Conference on Cycad Biology.



Figure 6.—: A specimen of *Ceratozamia mexicana* from the forest understorey population at Esquilon, about 10 km NE of Xalapa. Photo: Andrew Vovides.



Figure 7.—: A coning male *Ceratozamia mexicana* specimen in the Temperate House, Kew Botanical Garden, UK. This specimen may have been sourced from the population near El Mirador in Veracruz. Photo: Felix Merklinger.

Distinguishing features

The discovery of new *Ceratozamia* species, together with data from molecular sequence work (e.g. González & Vovides 2002) allowed Andrew Vovides and co-workers (2004) to identify at least seven complexes in the genus: the “*C. kuesteriana*, *C. latifolia*, *C. matudae*, *C. mexicana*, *C. miqueliana*, *C. norstogii* and *C. robusta* complexes”. The name “*Ceratozamia mexicana* complex” is used for this taxon in its widest sense, acknowledging that there may be sufficient morphological diversity within this concept to warrant future subdivision. It is possible that the “Naolinco” and “El Mirador” populations represent separate species, only one of which could retain the name of *C. mexicana*.

Ceratozamia mexicana has affinities with *C. robusta* - this is more so for the “El Mirador” plants and less so for the “Naolinco” populations that are generally smaller in vegetative and reproductive features. Jeff Chemnick and colleagues (2009) have drawn up a useful key to distinguish ceratozamia, using mainly leaf and leaflet morphology.

Ethnobotany

In the language of the Huastec Maya people (also known as Teenek), *Ceratozamia mexicana*, in common with several other cycads, is known as *tzalam-Thipac*



Figure 8.—: A *Ceratozamia mexicana* pollen cone just prior to dehiscence. Photographed at Cynthia Giddy’s nursery in South Africa, in 1990, by Roy Osborne.



Figure 9.—: An ovulate cone on a specimen of *Ceratozamia mexicana* in a garden in Austin, Texas. Photo: Craig Nazor.



Figure 10.—: *Ceratozamia mexicana* is well represented in many of the older European gardens. This specimen is growing at Jardin Botanique Thuret, Cap d'Antibes, France. Dennis Stevenson is behind the plant. Photographed by Roy Osborne in 1987, during the First International Conference on Cycad Biology.



Figure 11.—: An impressive *Ceratozamia mexicana* specimen growing in the grounds of Sartorius' El Mirador hacienda. It is said to represent the local population. Photo: Wes Field, October 2008.

or *tsalam-Thipaak* in reference to a mythical boy, called Thipac or Thipaak, who brought maize to the tribes (Bonta & Osborne 2007). The Xi'ói (Pame) people use the name *bijio'a* (Javier Fortanelli pers. comm.). In Spanish, this species, like many other cycads, is sometimes called *costilla de león* (puma's rib), *palma de camote* (from the Nahuatl *camotl*, tuber), *palma imperial* (imperial palm), *piña del monte* (wild pineapple-like fruit), and *tapacapon*, *tapacarbon* or *tapacarpon* (Bonta & Osborne 2007). Leaves of *C. mexicana* are used in church decorations, and the raw seeds have been used as a vermicide (Vovides et al. 1983).

Conservation status

Despite its fairly widespread occurrence, Stevenson et al. (2003) estimated the total number of mature *Ceratozamia mexicana* plants in the wild to be only 5000–10,000. Land clearance for banana and coffee production since the mid-1960s has severely curtailed the natural habitat of several populations. A positive development was the establishment in 1992 of a community nursery at Tlachinola, Veracruz, specifically for the sustainable propagation of *C. mexicana* (Vovides et al. 2002). This plant is protected by Mexican Law NOM-059-ECOL and it is listed as vulnerable on the IUCN Red List of Threatened Species (2010).

Cultivation

Ceratozamia mexicana grows well in cultivation and has been widely represented in international botanical gardens and private collections for many years. Its adaptation to low light intensities makes it useful for shady areas in the garden, or as a houseplant, and it is frost tolerant to -9°C . A significant number of *C. mexicana* "El Mirador" specimens were shipped into the USA the early 1970s; many of these plants have become popularised in parts of Florida under the name *Ceratozamia* "Lime Green".



Figure 12.—: Indian cycad researcher Rita Singh at the community nursery at Tlachinola, Veracruz, established in 1992 specifically for the sustainable propagation of *Ceratozamia mexicana*. Photographed by Lou Randall in 2005, during the Seventh International Conference on Cycad Biology.

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An Account of Eastern Cape Cycads in Habitat

Allan Tait



Figure 1.—: *Encephalartos altensteinii*: Plants in habitat.

As a horticulture student in service of the then South African Railways I was sent East London for my final year of in service training in the Eastern Cape. Cycads always fascinated me and little did I know I was on my way to Cycad heaven! Looking from the train window as it was winding down through cuttings and passes I couldn't believe my eyes when seeing a sheer cliff covered with cycads! This was an immediate stimulus to want to know more. After finishing my time in the Cape it would take another 6 years to do my first major Cycad expedition to this part of the world. I studied all the available literature, made contact with farmers, very often with the help of knowledgeable exchange operators and with the help of a botanist friend.

In April 1999 I was on my way, for a trip of a lifetime! Within two weeks I had seen all the Eastern Cape species in habitat. Being able to observe plants in their natural surroundings was the greatest possible reward! It surpassed even the greatest man made cycad collection known to me. In years to follow I would do many more such observations in the wild, firsthand experiencing various factors both positive and negative that plays a role in the future existence of this magnificent group of plants.

Encephalartos altensteinii and *E. villosus* were the first two species I got to know. The former species being planted for ornamental purposes in a major street in East London and the latter, also referred to as the poor mans cycad, being present in numerous gardens. In the wild these two species are, in cycad terms, still abundant and at many places can be found with ease. In the former Transkei I found a magnificent



Figure 2.—: *Encephalartos altensteinii*: Plants dug out in the Trankei.

E. altensteinii in the mountains but at the same locality firsthand experienced plants being taken out by locals to sell, and also being utilized for muti (medicinal) purposes. Local forms might however become lost to biodiversity.

Encephalartos friderici-guilielmi grows in abundance in parts of the grassland interior of the Eastern Cape, but populations are localized. On finding these plants I realized they were the plants I saw from my initial train journey through the cuttings. Magnificent specimens are still to be found and majestic plants with multi stems, some reaching 4m, can be found with ease. Veld fires, leaving blackened stems with no foliage but the typical skirt,



Figure 3.—: *Encephalartos altensteinii*: Muti collection in the Trankei.



Figure 4.—: *Encephalartos altensteinii*: Habitat in the Transkei.



Figure 5.—: *Encephalartos arenarius*: Only one female plant left in this habitat.



Figure 6.—: *Encephalartos arenarius*: Plant in habitat.



Figure 7.—: *Encephalartos arenarius*: Evidence of recent poaching activity.



Figure 8.—: *Encephalartos caffer*: Forest habitat.

stimulate both coning and new flushes of leaves. Populations are healthy with many coning plants producing good yields in specific years. Germination is good with some seed even germinating in the woolly crowns! This species seems to be in no immediate danger and most landowners conserve their plants.

Encephalartos cycadifolius occurs in the Winterhoek Mountains at high altitudes. Cold winters with snow and frost are a common occurrence. Large populations occur within a small range. Veld fires are frequent in this grassland habitat. In some years great numbers of cones are produced with huge quantities of fertile seed, however this can happen one year (masting Year) with many lapsing before a re-occurrence. Often severe droughts cause years of no coning that can last for prolonged periods. Porcupines are a huge problem with this species and numerous stems are annually destroyed by their activities. As the species suckers freely, damage is seldom detrimental however.

The grey leaved species, *E. horridus*, *E. trispinosus*, *E. lehmanii* and *E. princeps*, are unfortunately not faring so well due to their aesthetic appeal. All these species suffer to a lesser or greater degree, from plants being illegally removed from the wild. Especially superior forms are at risk and many a time the numbers of a population dwindle even in municipal resorts and nature conservancies, with plants in unprotected areas at greatest risk.

Encephalartos horridus is a species that often grows in easily accessible places, like succulent/spekboom thickets. The "dwarf" form from around Uitenhage is particularly under pressure from collectors. This form grows on quartzite outcrops, being far more visible. I witnessed virtually a whole population being wiped out by poachers, caught in the act!

In their distribution range forms occur and in my opinion the possibility exist that there are more plants in the wild than commonly believed. Finding these plants might prove difficult due to the impenetrable thorny vegetation, which serves as a saving grace to those plants.

Encephalartos trispinosus is the species that most time was spent to find, as I had no contact or farm to refer to on my initial trip. After driving up and down for two days and about to give up we stopped next to the road on an embankment. To my great astonishment a colony of about twenty plants, all of them in full cone were right before my eyes! Afterwards I found more plants and met landowners with plants on their properties. On the banks of the Kapp River in the reserve one can canoe upstream and see magnificent specimens on the kranztes growing close to *E. altensteinii*. Here I saw for the first time natural hybrids between two species.

Encephalartos lehmanii has a very wide distribution with many forms, some more attractive than others. Many populations had been denuded but many sustainable colonies still exist. Periodic droughts often place the plants under great stress. Plants recover well in good years however. Cone set and seedling regeneration in these times allow for the continued survival of the species. Seed destruction by rodent activities was observed, but they also serve as seed dispersal agents. Scale is often found on the older leaves of plants but caused little lasting damage. Porcupine damage in some areas is a cause of concern. Often the damage to plants is detrimental with many a



Figure 9.—: *Encephalartos caffer*: Grassland habitat.



Figure 10.—: *Encephalartos cycadifolius*: Cones imerging in habitat.



Figure 11.—: *Encephalartos cycadifolius*: Fire and porcupine damage.



Figure 12.—: *Encephalartos cycadifolius*: Healthy population.



Figure 13.—: *Encephalartos cycadifolius*: Masses of seed in habitat.



Figure 15.—: *Encephalartos friderici-guilielmi*: Seed germinating in crown.



Figure 14.—: *Encephalartos friderici-guilielmi*: Magnificent specimen.



Figure 16.—: *Encephalartos horridus*: Plants in habitat.



Figure 17.—: *Encephalartos horridus*: Disintegrating cones shedding seed.



Figure 18.—: *Encephalartos horridus*: Plants in habitat.

beautiful 2-3m trunk destroyed! Another disturbing fact is muti harvesting. With most other species “sustainable” harvesting practices was witnessed. Here, however, disastrous activities whereby leaves and all the bark from whole trunks of numerous plants were removed, was observed. This is guaranteed to destroy them!

Encephalartos princeps used to be plentiful in the catchments areas and tributaries of the Great Kei River. Most accessible plants have long since vanished. Viable populations are still to be found in remote areas where concerned landowners protect the plants. Conning is irregular and even then the viable seed percentage is relatively low. Seedling regeneration was observed though. Porcupine damage in certain areas is a problem but perhaps a matter of greater concern is the larvae of the leopard moth, that on an annual basis destroy most of the new



Figure 19.—: *Encephalartos lehmanii*: Glorious new flush of foliage.



Figure 20.—: *Encephalartos lehmanii*: Male cone.



Figure 21.—: *Encephalartos lehmanii*: Muti collection damage.



Figure 22.—: *Encephalartos lehmanii*: Severe damage due to muti exploitation.



Figure 23.—: *Encephalartos lehmanii*: Plants in habitat.



Figure 25.—: *Encephalartos lehmanii*: Rodent damage to seed in habitat.



Figure 24.—: *Encephalartos lehmanii*: Plants with scale infestation.



Figure 26.—: *Encephalartos longifolius*: Plants in habitat.



Figure 27.—: *Encephalartos longifolius*: Plants in habitat.



Figure 30.—: *Encephalartos longifolius*: Plants with scale infestation.



Figure 28.—: *Encephalartos longifolius*: Plants in habitat.



Figure 31.—: *Encephalartos longifolius*: Seed in habitat.



Figure 29.—: *Encephalartos longifolius*: Plants in habitat, Joubertina.



Figure 32.—: *Encephalartos longifolius*: Seedling re-generation.



Figure 33.—: *Encephalartos longifolius*: Specimen in habitat.



Figure 34.—: *Encephalartos princeps*: Leopard moth larvae damage.



Figure 35.—: *Encephalartos princeps*: Habitat on remote farm.



Figure 36.—: *Encephalartos princeps*: Leopard moth larvae damage.

flushes of foliage. This phenomenon had been observed on most other species but to a far lesser extent.

Finding *Encephalartos caffer* proved to be a daunting task. My first attempts, and then finding only plant through a contact of a friend, had me very excited! It would take another 3 years to find more. The reward was great and well worth the wait. The colony had well over 500 plants in a single, very well protected area. The plants were coning and seedlings abound!

Encephalartos longifolius, the first South African cycad species to be described, can still be observed in a number of places in its distribution range. This species perhaps occurs over the most varying of climatic and vegetation regimes. It is almost always associated with mountainous areas and often occur on steep to sheer slopes resulting in beautiful specimens, that can be observed from a distance, safe out of reach of would be collectors. A number of forms are known and the “Joubertina Blue” form would perhaps stand out as one of the best. Regeneration is very good and fair numbers of seedlings and juveniles had been observed in the different populations.

The fate of *Encephalartos arenarius* is a sad one. On my initial trip after some searching I found a number of populations, all in good shape, some coning with regular seed set. The species occurs in shady sand dune bush,



Figure 37.—: *Encephalartos princeps*: Porcupine damage to plants.



Figure 38.—: *Encephalartos trispinosus*: Natural hybrids with *E. altensteinii*.

close to the coast. In years to follow the picture would change dramatically and in 2008 on arriving at one population I found that all but one plant, had been removed only days before my arrival. Leaves, debris and holes being the silent evidence of a once beautiful population. Since they grow in easily accessible places, in sandy soils, removing them is no difficult task. In May 2010 I could find but a single plant in all the locations known to me!

The species that evoke fond memories is *Encephalartos latifrons*. After long and lengthy negotiations on my initial trip I was shown a magnificent multi-stemmed specimen on a remote farm. This is a sight that I will never forget. Today I have transparencies that forever will remind me of it's glorious past! A few dedicated landowners deeply care about their plants, but face a daunting task to try and police the last remaining plants.

After my observations of Eastern Cape cycads in the wild, I am filled with mixed emotions. These glorious plants that have survived through millennia, saw changes in climate, more than likely witnessed many different predators, some long gone and others still present. They can survive the current known threats like porcupines, larvae, weevils and severe unfavourable climatic conditions but now they face the ultimate threat: The greed of MAN!

It is this generation's responsibility to make a difference. Landowners, lawmakers and responsible individuals that care, need to take hands and find solutions, to ensure the future survival of these plants before it is too late!



Figure 39.—: *Encephalartos trispinosus*: Habitat with *Aloe* and *Euphorbia*.



Figure 40.—: *Encephalartos trispinosus*: Plants in habitat.

A trip to the habitat of *Encephalartos longifolius*.

AJ Cilliers and EH Berry



Figure 1.—: *Encephalartos longifolius* : Plants near the Kouga Dam.

I believe that there is really nothing as fulfilling for the cycad enthusiast as a trip into the veld to see *Encephalartos* in its natural habitat. We have been fortunate enough to see several species in the habitat, but on holiday recently in Knysna we decided that we had to view at least one species in habitat while we were in the Eastern Cape.

As we all know the Eastern Cape Province of South Africa is probably the most cycad rich area in the world with regard to species diversity. We were fortunate enough to know a farmer in the Patensie area where *E. longifolius* grows wild. Many collectors and enthusiasts that I have spoken to through the years have stated that *E. longifolius* is without doubt one of the most beautiful of the South African cycad species. So it was with great anticipation and excitement that we set off from Knysna to Patensie with the view to visit the habitat of *E. longifolius*.

The farmer has a collection of his own, which included a beautiful male *E. inopinus* and a nice *E. dyerianus*, which he purchased many years ago and that have developed into beautiful adult plants. I must mention that the farmer (who shall remain unnamed) was unbelievably friendly and hospitable. He offered to take us to the habitat at his own cost with very short notice. It was wonderful to see that strangers could still be treated so courteously in these times.

He started by taking us to the Kouga Dam. When standing at the dam wall and looking across the ravine the *E. longifolius* plants are clearly visible far in the distance (see figure 1). The colony appears to be very healthy and there are approximately 25-30 adult plants visible, using binoculars. The plants are massive and totally inaccessible, probably the reason why they are still there.

We then moved on to the farmer's game camp. Interestingly, we also saw a herd of wild donkeys in the camp!! I never knew there were such things as wild donkeys.....! But that was not our mission. We wanted to see *E. longifolius*. I was beginning to wonder whether we would get close to any of the plants, based on the view across the Kouga river ravine. We wanted to actually stand among the cycads. As we progressed, I became more and more grateful that we did not navigate the road in my own vehicle. The road was barely a road and the average speed must have been something around 3km/h.

Anyway, we were enjoying the scenery ("spekbome" everywhere) and the wonderful stories that the 85 year old farmer was telling about the cycads and his knowledge of the indigenous vegetation. Eventually he stopped. We could see no cycads. He told us to walk down the hill and look to the left. What we saw was a cluster of *E. longifolius*, containing two stems and a lot of basal suckers (see figure 2). Both stems seemed to come from the same rootstock, and the farmer claims that the one stem



Figure 2.—: *Encephalartos longifolius* : Plants in habitat.



Figure 3.—: *Encephalartos longifolius* : Plants in habitat.



Figure 4.—: *Encephalartos longifolius* : Plants in habitat.

is male and the other female!! This was confirmed when we noted a few seedlings in the immediate area.

Many pictures were taken and we were satisfied that we had seen the plants close-up. But this was just the beginning.....!

We moved off and the farmer patiently gave us time to take pictures and study the plants. We stopped on another ridge and viewed about 12 adult plants on the other side of the ridge. We proceeded and the road became worse, but the worse the road became, the more cycads

we saw. Eventually we stopped again and the cycads were all around us (see figure 3)! We walked through the bush to a beautiful cluster of about 5 adult stems, ranging from 1.5 meters to 2.5 meters in length (see figure 4). It was again encouraging to see seedlings here and there in the grass. We realized at that time that the mountains around us, and the ravines between the mountains, must all have *E. longifolius* growing in them. However, it is very encouraging to see that the habitat where this species survives is not a very accessible habitat at all!! I believe that the plants that we saw are safe from poachers and should survive for many more years in the habitat.

A Molecular Phylogeny of *Encephalartos*: Early findings

Philip Rousseau *

The relationships within the genus *Encephalartos* has been the study of many botanists for many years and is still not resolved. To date no complete molecular phylogeny (a diagram showing the relationships between species based on molecular data) has been compiled for all known *Encephalartos* species. The early results presented here form part of the DNA barcoding initiative as published in the previous issue of *Encephalartos* and aims to eventually produce a molecular phylogeny. This would help add weight and possibly reinterpret the already proposed morphological and geographical associations as presented by Vorster (2004). The genes that are currently being looked at are those proposed by more than 50 scientists from around the world who have collaborated under the International Barcoding of Life initiative (<http://www.barcoding.si.edu/whatis.html>) and have been used extensively to produce phylogenies. The gene regions are: *rbcL*, *matK*, *trnH-psbA* and ITS.

Early on in the study *trnH-psbA* was disregarded as a possible region as previous sequenced specimens showed no variation what so ever within the genus. This however does not indicate that all *Encephalartos* species should be considered a single species, we are simply looking at a single "trait" that seems not to have changed. For *rbcL* to date 181 samples, representing 57 species, have been successfully sequenced. Again very little variation was found even between the most distantly related species. The region however has been used several times to infer relationships between genera with good success, though it simply doesn't have the resolution power to distinguish between species, again indicating a very slow evolution rate. During the first pilot study into DNA barcoding (Sass *et al.* 2007) *matK* was abandoned due to failure in amplification the region, an integral part of the process. This again has been the case here even though primers (used to amplify specific DNA regions) have been developed since that have been successfully applied. The centre for DNA barcoding in Canada however is currently busy designing a *Encephalartos* specific primer set which will then be employed. The most promising region, currently done exclusive at the University of Johannesburg by myself, is ITS. The region has proved to be sequenceable without problems and has shown some variation between species, though not enough to completely differentiate between very closely related species. The very early results presented here then are exclusively from this region and due to the ongoing nature of the project will be kept vague. To date 54 samples have been completed up to analysis representing 36 species mostly from southern Africa. Currently various groups or lineages are formed, named here for convenience, with the relationships within such lineages still remaining uncertain.

The first group is the "fine leaf-wooly cone" lineage represented by species that cone 6 months out of tune

with other species, this lineage forms a sister group (a group closes too but not included in another group) to all other *Encephalartos* species. This lineage corresponds directly with the currently recognised group, though not all possible members have been analysed. The next recognisable group is the "underground stem" lineage with soft stems and fringed cone scales mostly from the South African east coast. This group corresponds directly to the associations proposed with most taxa of the group already included. Interestingly sister to the group, forming one of its own, is *E. ferox*, also known from the northernmost parts of the South African east coast and Mozambique with a sometimes subterranean, softish stem. The next group sees the blue leaved *E. munchii* alone (as no other taxa from the proposed group have been analysed) sister too the the larger "Northern-blue leaved" lineage. This group is characterised by its distribution along the northern escarpment of South Africa and blue-green foliage. The group included all species as per Vorster (2004), though *E. hirsutus* has not been included for analysis and might still be included therein. These three previous groups form a larger group within the non fine-leaved *Encephalartos*. The next group within the last larger grouping of *Encephalartos* is the "widely distributed-large-green leaf" lineage from eastern South Africa with very similar cones. Here however only two of the species thought to belong to this group is included and forms a sister group to the remaining member. This last member forms a group along with *E. woodii* on the next branch, also quite separate from other groups. These two species are again linked by their large stature and long green leaves. Very few samples however have been analysed here and relationships may change with the increase in replicates.

The next largely separate group is the "lobed leaved-single cone" lineage of which all of the species are from the Eastern Cape Province (South Africa). Mostly these plants grow in more arid conditions and all have clear petioles. This corresponds well with the current thinking except for *E. princeps* which is speculated to be form its own grouping due it producing multiple cones.

The last major group includes two separate smaller groups. Branching off first is the "raised vein" lineage hailing from Swaziland, while the other includes two species of the "large-green leaf-nothern Kwazulu Natal" lineage. This group is very similar too the "widely distributed-large green leaf" lineage though species have distinct female cones. These two groups coincide precisely with the current thinking though only half of the last lineage's species have been included for analyses.

So far then the results are congruent with molecular work in cycad genera, all reporting very low genetic variation. This lack of resolution will be remedied by the study of other genes outside the proposed regions. Results are also mostly in agreement with the currently held morpho-geographic understanding of relationships within the genus. However many more species are in the pipeline to be analysed and only when a full complement of

* MSc Student, Molecular Systematics. Department Botany and Plant Biotechnology, University of Johannesburg. Contact: pr.philiprousseau@gmail.com

both species and replicates are analysed can a definitive answer be produced. To echo the most recent *Encephalartos* taxonomic specialist Dr. Piet Vorster (2004): “When constructing a phylogeny it is essential to keep in mind basic biological principles concerning reproductive behaviour, isolation and geographic distribution” — and as such this phylogeny will be kept honest by these concerns and these early results seem to be a step in the right direction.

References

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- Sass C., Little D.P., Stevenson D.W., & Specht C.D. 2007. DNA Barcoding in the Cycadales: Testing the Potential of Proposed Barcoding Markers for Species Identification of Cycads. *PLoS ONE*. Available online from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2063462/>

Receptivity in female *Cycas* cones

William Tang *



Figure 1.—: *Cycas chamaoensis* female at receptivity to pollination.

Female cycad cones persist on plants for long periods ranging from 6 months to over 2 years. They are receptive to pollination, however, for only a fraction of this time, typically 1-2 weeks. Because of the fleeting nature of the receptive cycad cone, they are rarely photographed. Of all the pictures that have graced the cover of *Encephalartos* over the years, only 3 have shown cones at receptivity. These have been *Cycas revoluta* (#41 & 96) and *C. panzhihuaensis* (#48). Receptivity patterns of female cones are characteristic of many species (see Tang, 1995), yet because of their fleeting nature, they have never been used, to my knowledge, as part of the species description of cycads, even though it is quite likely that different species could be distinguished by the receptivity pattern of their female cones. Pictured here are four species of *Cycas* whose female cones have rarely been photographed (Fig. 1-4).



Figure 2.—: *Cycas diananensis* female at receptivity, at the Montgomery Botanical Center, Florida.

* Miami Springs, Florida U.S.A.

Literature Cited

Tang, W. 1995. Handbook of Cycad Cultivation and Landscaping. Cycad Conservation Co., Miami.



Figure 3.—: *Cycas pranburiensis* female shortly after receptivity.



Figure 4.—: *Cycas tropophylla* at receptivity; sporophylls are loose, but are more tightly compressed together before and after receptivity.

PSST - GOT ANY DIRTY CYCADS?



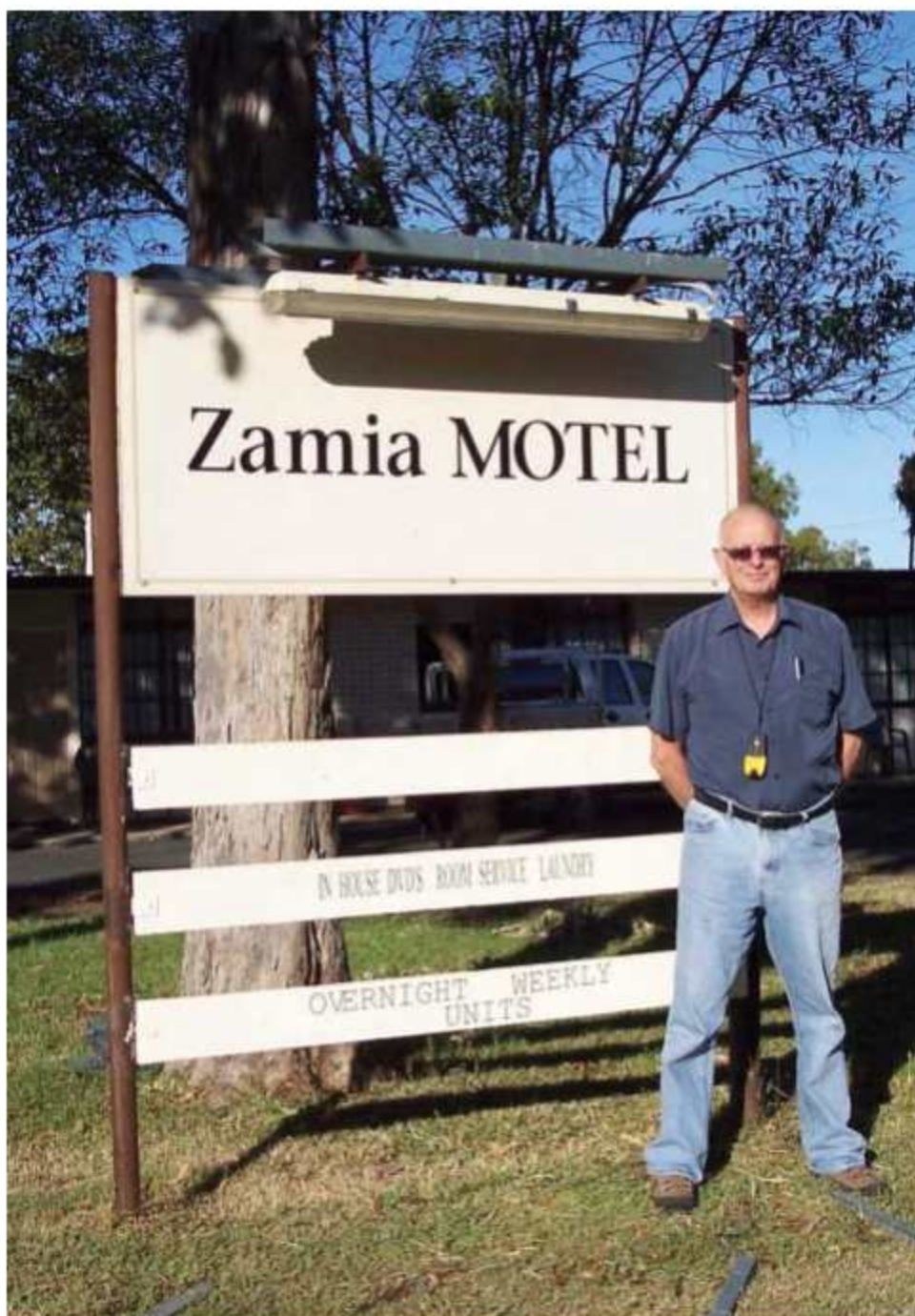
Well, we can get them clean real soon!



After which a brisk stroll might be in order



But if a mechanic is needed...



But if they need a rest, we know the place



And then there's always the retirement home

Photo credits:

1. The Cycad Laundromat (so it should be) in Middelburg, Mpumalanga Province, South Africa, near the habitat for *Encephalartos lanatus* and *E. middelburgensis*. Photo: Roy Osborne.
2. The Zamia Motel, Springsure, Queensland, Australia, near the habitat for *Macrozamia moorei*. Photo: Harvey Ottley.
3. Signage at Mount Archer National Park, Rockhampton, Queensland, Australia, at the habitat for *Cycas ophiolitica* and *Macrozamia miquelii*. Photo: Roy Osborne
4. Zamia Motors in Springsure, Queensland, Australia. Photo: Roy Osborne
5. Signage to Rancho Dion Biological Field Station in the Sierra Sur of Oaxaca, Mexico, near the coastal resort of Huatulco, a 76 hectare property jointly owned by Jeff Chemnick, Tim Gregory and Silvia Salas-Morales. Photo: Jeff Chemnick

CONGRATULATORY MESSAGES FROM MEMBERS

Dear Editor,

Congratulations on this momentous occasion, No. 100 of "Encephalartos"! Here's wishing many hundreds of more issues of this valuable publication, which does so much to support cycad research, conservation, and public awareness. With all best wishes to Wynand van Eeden and all past editors on this milestone event.

With best regards from a loyal subscriber,

Doris Francis
Santa Fe, New Mexico, USA

Dear Editor,

I want to thank you for your excellent work on Encephalartos. I enjoy receiving each new journal and find the articles interesting and informative and the pictures outstanding. Congratulations and please keep up the great work.

Jeffrey Brusseau, "Cuesta Linda"

Dear Editor,

Congratulations for reaching this very important milestone!

Encephalartos is a wonderful publication, and expertly fills an important niche for important and engaging information about all aspects of cycads. It is of special importance to us here in Miami, helping us further broaden our perspective on cycad issues.

Looking back through our archives here, it is clear that Encephalartos has consistently advanced in scope, content, design, and appeal through the first 100 issues. I expect the next 100 issues will also be appealing, interesting, and useful. I look forward to reading each one!

Sincerely,
M. Patrick Griffith
Executive Director, Montgomery Botanical Center
Coral Gables, Florida, USA.

Dear Editor

100 not out! Congratulations to all involved on this splendid achievement.

Roy Osborne, Brisbane, Australia.

[It must be said here that Roy is the founding father of this society. He has also contributed a huge volume of articles for publication and thus not only gave us the society but stayed actively involved, to make ENCEPHALARTOS as good as it is today. Many a time he came to the rescue with an informative, well written article, when the poor editor had little to publish.]

NEWS FROM ZIMBABWE

Dear Sir

Thank you for your latest copy of Encephalartos.... and yes I would still like to receive my copy. I do have many potential publications for your journal with some great photographs, these being:

1. The ZIMBABWE CYCAD TRUST
2. Visit to Mt Zembe
3. Re-discovery of a lost *E. Manikensis* site...is it a new species?
4. A re-look at *E. chimanimaniensis* distribution.

I am constantly working on these type of issues and the main one being – if *E. manikensis* should be further divided. Still collecting data here.

Regards
Ian Waters



Figure 1.—: A photograph of the new *E. manikensis* locality.

PRAGUE CYCADS AND PALMS EXHIBITION

July 10 – August 29, 2010
Main Part - **weekend of July 10-11, 2010**

The yearly Prague Palms and Cycads exhibition will be opened from Friday, July 9, until August 29, 2010. The main activities of the exhibition will be centered around the weekend of July 10-11 in the Prague Botanic Garden <http://www.botanicka.cz> and its new Fata Morgana Greenhouse. The event is prepared in cooperation with the Czech Cycads www.cykasy.cz website.

Traditionally, the number of visitors of this single regular European cycads event is highest over the weekends with around 2-4.000 visitors over the two days, with a maximum of 70.000 visitors over the whole summer.

The new exceptional Fata Morgana Greenhouse and its research greenhouses will be the main venue of the exhibition. Natural break-up of the rocky original surface of the greenhouse is artfully exploited for terraced planting of displayed vegetation. Its remarkable "S" shape and unique solution for exhibition area is covering approximately 1750 sq. meters and is considered to be unparalleled in Europe.

Seminars will take place in the nearby Prague ZOO on Saturday July 10.

Jan Vytopil
Czech Cycads
www.cykasy.cz

Prague Botanic Garden <http://www.botanicka.cz>

CROWN DAMAGE FIXED WITH CEMENT!

Dear Editor,

Some 6 months ago, during the height of summer, a +/- 1.4 meter tall *Encephalartos natalensis* in my garden, broke off at the crown. It was surprising, as this very healthy and robust [new foliage 2x a year] plant had shown absolutely no sign of distress, damage, rotting stem or sagging fronds or exposed crown. We did not have excessive wind and neither was it recently transplanted.

The only possible reason could have been excessive water as we had plenty rain in Durban then, however the soil is very sandy and porous and drains well. It may have been excessively heavy foliage as I had not cut it back for 2-3 years and the foliage was touching the ground. Sadly, the crown had a clean 'break, with the 'head' of leaves lying on the ground, and a totally exposed soft stem.

I dusted the exposed part with Yellow Sulphur powder, 'plugged' the exposed cone with a cement and riv-



Figure 1.—: *Encephalartos natalensis*: Mature plant with crown damage.



Figure 2.—: *Encephalartos natalensis*: Crown filled with cement and sand mixture to prevent water causing more problems.



Figure 3.—: *Encephalartos natalensis*: New growth next to problem area.



Figure 4.—: All the damaged tissue must be cut away until healthy tissue is exposed, then stem must be sealed with one of the commercially available sealants for plants. Photo by X. de Kock



Figure 5.—: Place a pot or some means to keep water off the plant on the wound. New growth will be formed once the plant recovers from its ordeal. Photo by X. de Kock.

er sand mix, then cover it with a waterproof cover. Over the past few months I kept feeling the top of the stem for possible signs of rot or disintegration of the stem.

To my delight, a few weeks ago, when checking, new leaves had begun (now 2x new sets on opposite sides) had appeared. I am truly excited at the prospects of having saved this plant.

I am however still apprehensive, as the leaves grow, the unnatural cement plug may lift, resulting in possible water seepage and possible rotting of the stem. I am however hesitant to again cover the crown due to the new leaves.

Thank you.

The Niensens
[fulloutputcc@telkomsa.net]

[Crown damage can be caused by several factors, of which trauma (as suspected in this case), fungal infection or weevil (*Phacocorynes variegatus*) damage are the most common. It is always important to establish the extend of the damage and this is best accomplished by cutting out all the dead or damaged tissue. In mild cases this involves removing the dead leaf bases and cataphylls or cutting the head off (Figure 4) at an angle to help with draining, exposing the different layers of the stem. At this stage it is important to seal it off with something like Treeseal or Steriseal to protect the very vulnerable starch rich medulla. The latter is prone to rot and need additional protection from moisture with a pot (Figure 5) or cement-sand mix. I always check if the plant has a good root system and if not will treat it with one of the multiple kelp based products on the market. Recovery will be by the production of new growth points at the junction between the cortex and leaf base (Figure 5). Xander de Kock]

ERG ONTSTELD!

Is dit hoe die nuwe regering oor bewaaring voel?

Die mee gaande foto's is van 'n *E. transvenosus* ('n Vroulike plant wat 3 keëls gehad het met neem van die eerste foto's aan die begin van die jaar) in die Johannesburgse middestad. Die plant was seker 'n goeie 1,7m bo die grond oppervlak.

Met skok moes ons middel April opmerk dat die betrokke boom afgekap is, of sal ek eerder se geskend is, om plek te maak vir n nuwe park van beton stene en trappe!

Hoekom het Johannesburg Parke dan nie die plant verskuif na een van hul vele Botaniese tuine nie?! Daar is die Wilds met sy prag tuine, die Emerencia Botaniese Tuin met self 'n mooi versameling bome en dan praat ons nie eers van die Walter Sisulu Tuine in Roodepooert nie!!

Dit kan mens net laat TREUR !

Sarel Pretorius
(Foto's deur Pierre Strydom)

[Hierdie brief en foto's is aan die Johannesburgse Stadsraad gestuur vir kommentaar maar geen terugvoer is ontvang teen druktyd nie.

Sarel reports a beautiful specimen of *E. transvenosus* in the centre of Johannesburg that was unceremoniously cut down to make space for paving. Instead of being transplanted to one of the many gardens or reserves in and around the city it was simply destroyed. Figure 1 shows the healthy plant at the beginning of 2010, Figure 2 clearly shows female cones and Figure 3 is evidence of the destruction of a scarce threatened plant, protected by law. The letter and photographs were sent to the Johannesburg City Counsel for commentary but no reply was received. Ed.]



Figuur 1.—: 'n Gesonde *Encephalartos transvenosus*, gesien aan die begin van 2010.



Figuur 2.—: Vroulike keëls kan duidelik gesien word in die foto.



Figuur 3.—: Die tragiese einde van 'n mooi gesonde, skaars, bedreigde plant.



Figure 1.—: *Encephalartos msinganus* open ground project fertilized with Cycad Boost



Figure 1.—: *E.msinganus* plant with a 20cm diameter stem



Figure 1.—: Leaf detail of *E.msinganus* growing in full sun

GROWING CYCADS IN OPEN GROUND

In August 2005 a unique retail centre, Exclusive Cycads specializing in *Encephalartos* species opened its doors in Pretoria. During the first phase of development of the property, before the official opening, a seedling propagation programme was already in place. Although a lot of planning was done to make this venture succeed, it was soon realized that the future demand for *Encephalartos* species for both the local and the export market, would exceed supply.

It was decided that a project to grow *Encephalartos* seedlings in open ground was the solution. At this stage, the development of the cycad fertilizers Cycad Boost 1 and 2, Cycad Grow Stim and the very successful Cycad Root Stim was completed.

Thousand of *Encephalartos* seedlings were planted in open ground in the Gauteng Province and later in the Lowveld of Mpumalanga Province which has a more favourable climate for growth. These seedlings were fertilized with Cycad Boost 1 and 2 according to the prescribed programme and the results speak for themselves (fig.1). With in only a few years, these seedlings have grown into "adult" plants in excess of 15cm in diameter (fig.2-7)

These seedlings are now available for the local and export market (<15cm). Exclusive Cycads are open 7 days a week and can be contacted at the following numbers:

Tel: 012 548 0325 Fax: 012 548 5644 Cell: 083 389 2260 (Lezani)
 E-mail: info@exclusivecycads.com Exports: azurekoi@gmail.com



Figure 4.—: Part of a newer planting of *E.eugene-maraisii* seedlings



Figure 5.—: *Encephalartos laevifolius* seedling in the open ground project in Gauteng



Figure 6.—: *E.eugene-maraisii* seedling after a few years of Cycad Boost treatment



Figure 7.—: *E.cerinus* seedling ready for the retail market